

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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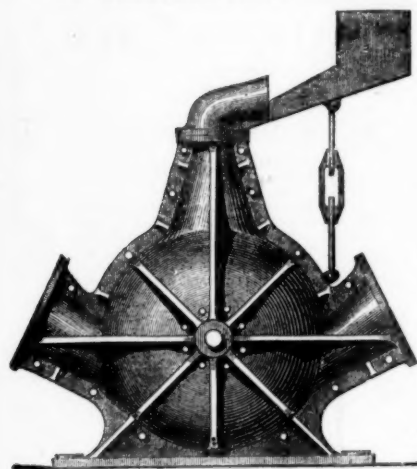
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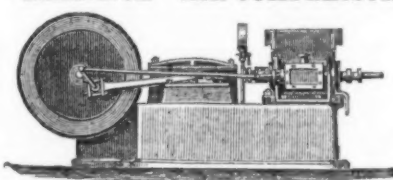
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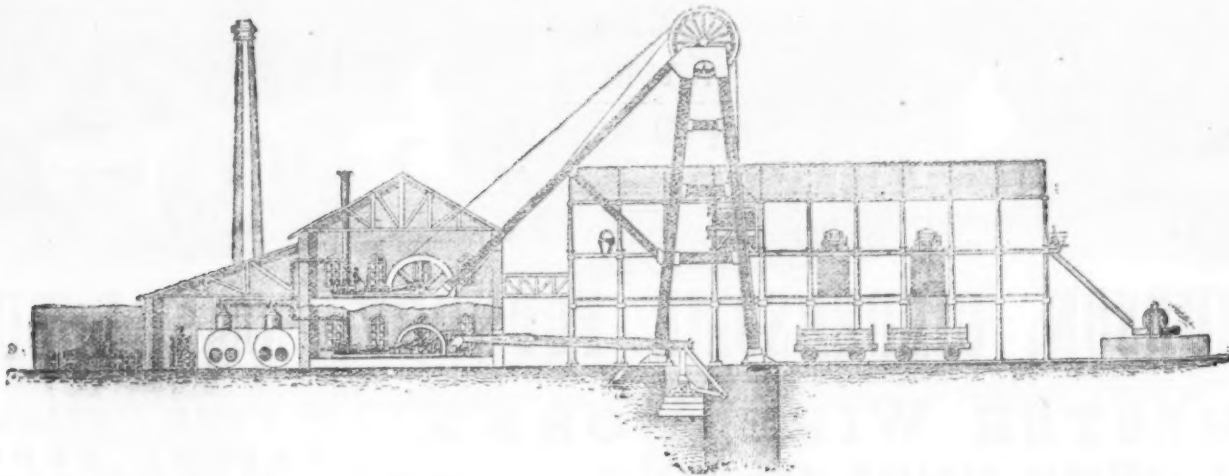
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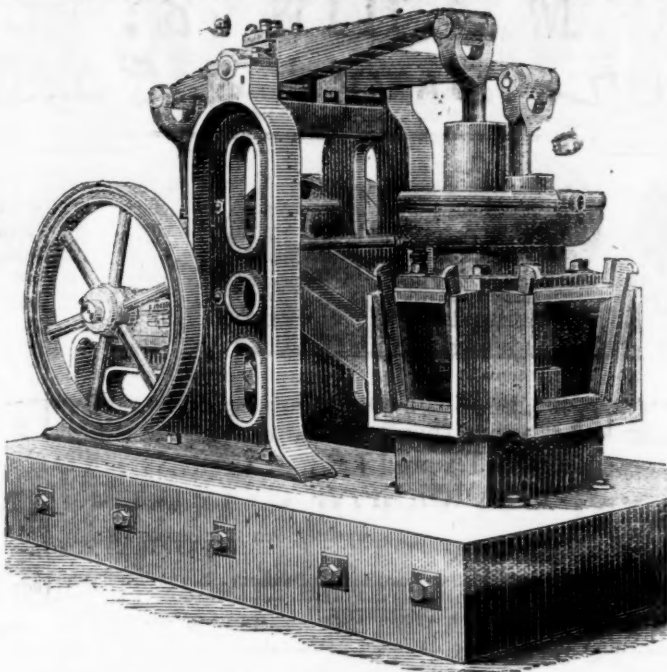
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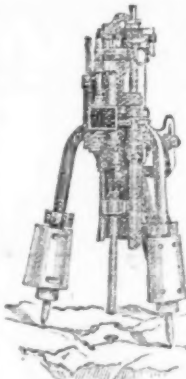
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APPLICATION.

Mc CULLOCHS & HOLMAN BROS. PATENT "CORNISH" ROCK DRILL. 1ST SILVER MEDAL. MINING INSTITUTE OF CORNWALL. 1881.

This machine has been constructed after a long practical experience in the requirements necessary for Cornish mines. The result has more than realised our expectations. Our chief objects in view were GREATER DURABILITY and LESS LIABILITY TO DISARRANGEMENT, but it has also proved itself MORE EFFECTIVE. (Vide Report.)

CAMBORNE, 8TH DECEMBER, 1881.

MINING INSTITUTE OF CORNWALL.

SIR,—Having been requested by the Council to superintend the Rock Drilling Machine Contest, held at Dolcoath Mine to-day in connection with the above Institute, I beg to hand you the following report:—
The competing machines were the "Barrow," the "Cornish," and the "Eclipse"—each was fixed on the same mounting bar, and bored into the same stone. The result of the boring was as follows:—

Name of Machine.	Diameter of cylinder.	Diameter of Drill.	Time boring.	Depth bored.	Cubic inches of ground cut.	Cubic inches cut per minute.	Mean pressure per square inch.	Remarks.
	In.	In.	Min. Sec.	In.			Lbs.	
Cornish.....	3½	2	1 15	4½	14.1	—	—	
".....	—	1½	55	9	21.6	—	—	
Total.....	3½	—	2 10	13½	35.7	16.4	61	
Eclipse.....	3½	2	40	—	—	—	—	} Ran into Cornish hole; hole not properly watered.
" second try.....	—	—	2 0	1	3.1	—	—	
" third try.....	3½	2	2 35	11½	35.3	13.6	60	
Barrow.....	4	1½	15	½	1.2	—	—	Gland to mounting bar broke.
".....	—	—	2 0	8½	19.18	—	—	
Total.....	4	1½	2 15	8½	21.0	9.3	60	

I am, Sir, your obedient servant, JAMES HOSKING, M.E.
To R. H. Williams, Esq., C.E., President of the Mining Institute of Cornwall.

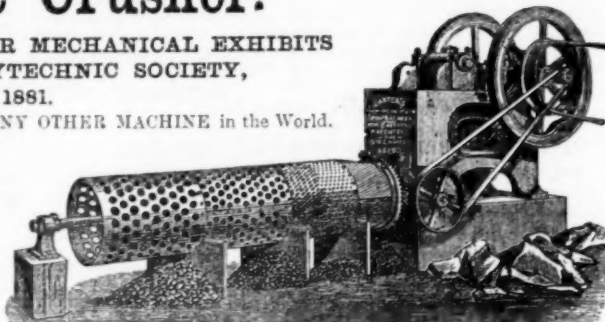
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The Only Knapping Motion Stone Breaker and Ore Crusher.

AWARDED THE ONLY SILVER MEDAL FOR MECHANICAL EXHIBITS
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GUARANTEED to do MORE WORK with less power THAN ANY OTHER MACHINE in the World.
READ THIS—

The Bold Venture Lime and Stone Co., Peak Forest,
Messrs. W. H. Baxter and Co., June 8, 1881.
GENTLEMEN,—We have the pleasure to inform you that the 20 by 9 Stone Breaker supplied by you is now working to our entire satisfaction, and we are now able to fulfil our contract with ease, which we had much difficulty in doing before with the Blake Machine. It takes less power and turns out considerably more stone.
Yours truly,
BOLD VENTURE LIME AND STONE COMPANY.



GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT.

These Machines turn out the same amount of work with less than half the power, and make a better sample of Road Metal, with 50 per cent. less waste, than any other machinery, and for Crushing Purposes they are still more advantageous, as the sudden action entirely dispenses with the clogging when used for crushing softer materials, and thereby saves many breakages and a great waste of power. There is also a saving of fully 75 per cent. of lubrication required over the Blake Machine, and as a proof of this, our driving shaft never becomes heated. We are also prepared to guarantee our driving shaft from breakage in any of our Knapping Motion Stone Breakers.

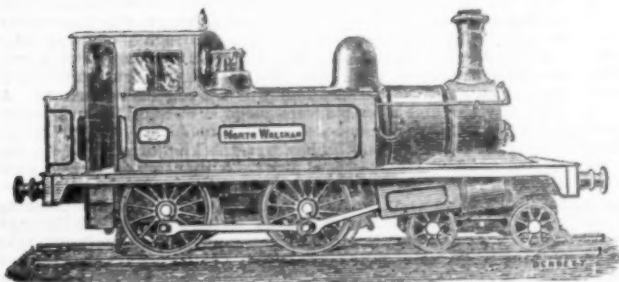
We have already supplied our Machines to Derby, Harrogate, and Falmouth Local Authorities; besides several Quarry Owners, Contractors, Plaster Manufacturers, Mining Companies, &c.

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OF ALL SIZES AND ANY GAUGE OF RAILWAY.
OF GREATLY IMPROVED CONSTRUCTION
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CONTRACTORS, IRONWORKS, COLLIERIES.

For Cash or Deferred Payments.

SOLE MAKERS OF RODGERS' PATENT WROUGHT-IRON PULLEYS.

CRUSHING AND TREATING AURIFEROUS ORES.

A series of general improvements in the construction and arrangement of machinery for treating auriferous and other ores has been invented by Mr. C. J. APPELBY, of Cannon-street. They consist of stamps, amalgamating boxes, buddles, &c. Assuming that two batteries, containing three stamps each, are to be used, he arranges a suitable foundation, preferably of timber piles, at the upper part of the floor where the operations are to be conducted, and upon this foundation he arranges the two batteries of stamps in line with each other, but separated by a sufficient distance. The support which carries the batteries upon the piles or other foundation consists of beams or girders of iron plates and angle irons rivetted or bolted together, and made in pieces of such size and weight that they can be readily transported. Upon the support so constructed (which may be covered with a floor of iron, wood, or other suitable material), he fixes strong vertical frames, also of iron plate and angle iron, supported by suitable struts, and having cross beams similarly constructed, to which are bolted guides, preferably of wood, in which the upper ends of the stamp rods are guided, these rods being preferably cylindrical bars, so that they can turn round in the guides. Near the upper part of the framework described he bolts or otherwise fixes bearings in which revolves a horizontal shaft upon which are keyed cams or lifters by which the stamps are lifted. These cams are arranged so as to come into operation in succession, and they operate upon circular discs or lifting plates fixed upon the stamp rods by screws and adjustable nuts, so that their position may be accurately adjusted.

Upon the floor or platform below and between the batteries of stamps he arranges a steam-engine and boiler of any convenient form and design, and upon the driving shaft of such engine, or upon a shaft connected to it, he fixes a chain wheel round which passes an endless chain, also passing round a corresponding chain wheel above the shaft which carries the lifting cams. The lifting cams upon each battery of stamps can be connected with or disconnected from the shaft so actuated by means of a suitable clutch box actuated by a handle below, so that either or both the batteries may be set in motion or stopped as desired. The cam shaft or the engine-shaft may also be supplied with a crank or cranks actuating one or more pumps, by which water is pumped up into a cistern at a sufficient height, whence it is brought down through pipes and admitted as required into the stamp boxes into which the auriferous quartz is fed and pulverised. From the stamp boxes the auriferous quartz, discharged through screens when sufficiently pulverised, passes together with the water through conducting shoots into amalgamating boxes placed at a lower level, but carried upon the same foundation and supports.

These amalgamating boxes are preferably of iron and rectangular in plan. The back and ends of the box are of considerable height, and in the ends guides are formed within which are adjusted at a short distance from and parallel with the back a plate or board, the lower end of which descends to within a short distance of the bottom of the box, dipping below the surface of mercury with which the bottom of the box is supplied. The pulverised quartz and water, therefore, admitted into the space between the back of the box and the adjustable board or plate described descend through the mercury, up which they rise, part of the gold being detained and amalgamated with the mercury, and they then pass over the front edge of the box, which is a little above the surface of the mercury, and thence fall if required into a similar box where a further quantity of gold is detained, and whence if necessary they may again pass into similar boxes, or into shoots or troughs, which conduct them into buddles or concentrating apparatus thus arranged and actuated. He prefers to arrange one buddle to each battery of stamps at a lower level than the amalgamating boxes described, and supported upon timber or other foundations. Each buddle is complete in itself, and consists of a horizontal pan or vessel of suitable diameter constructed of iron plates rivetted or bolted together. Transversely across the top of each buddle a framework of iron plate and angle irons is arranged, which carries bearings in which revolves a horizontal shaft parallel to the engine shaft, and driven at a suitable speed from the latter by means of chain wheels and an endless chain. This shaft drives by means of bevelled toothed wheels a vertical shaft revolving in the centre of each buddle in bearings in the bottom of the buddle, and in the transverse frame above, and each transverse shaft carries a horizontal revolving frame which revolves above the buddle, and is provided with adjustable rakes, scrapers, brushes, or cloths, by which the surface of the auriferous sand which is admitted through a trough to the centre of the buddle from the amalgamating boxes already described is smoothed and made uniform and even.

The particles of gold being heavier settle down near the centre of the buddle, whilst the lighter and poorer sand fills its outer part, the water eventually flowing away, and being made to pass, if necessary, through settling pits, in which any auriferous quartz still remaining in suspension is deposited. When the buddle is full the revolutions of the vertical central shaft is stopped by means of a clutch box upon the transverse revolving shaft, which drives it, and the auriferous sand, concentrated and enriched, as described, is removed, and the gold extracted by amalgamation, or other well-known means. He prefers to coat the interior surfaces of the amalgamating boxes and of the buddles or concentrating apparatus with enamel, in order to prevent injurious action in the presence of the mercury. Buddles constructed and arranged in the method described are self-contained, and, consequently, are very easily fixed in their places, and removed as may be desired. And by the method of construction of these several parts of the entire apparatus, and by the method of arrangement described, in which the whole series of processes is continuous, the entire mechanism being supported and adjusted by, and at the same time forming part of the framework which carries it, great economy both of construction and in fixing and removing the machinery or apparatus, as well as in working it is effected.

SECONDARY BATTERIES.—To render unnecessary the use in secondary batteries of a porous pot which creates useless resistance to the electric current, and to store in an apparatus of comparatively small weight and bulk considerable electric force, Mr. ERNEST VOLCKMAR, of Paris prepares two reticulated or perforated plates of lead of similar proportions, and fills their interstices with granules or filaments of lead, by preference chemically pure. These plates are then submitted to pressure, and placed together, with strips of non-conducting material interposed between them, in a suitable vessel containing acidulated water. The plates being connected with wires from an electric generator are brought for a while under the action of the current, to peroxidise and reduce the whole of the finely-divided lead exposed to the acidulated water. The secondary battery is then complete. It will be understood that any number of these pairs of plates may be combined to form a secondary battery, their number being determined by the amount of storage required. The perforated plates of lead may be prepared by drilling, casting, or in other convenient manner, but the apertures, of whatever form, should be placed as closely together as possible, and the finely-divided lead to be peroxidised is pressed into the cells or cavities so as to fill their interiors only.

Original Correspondence.

QUICKSILVER.

SIR,—Advices from San Francisco state that the production of quicksilver in California is likely to be considerably diminished this year, and confirm the closing of the Guadalupe Mine, announcing also that the Sulphur Bank Mine had a cave last fall, and adding the future of this mine is, so far as production is concerned, quite problematical, thus again reducing the Californian production by some 16,380 bottles, or, on the application of last year's standard to the current season, making the return for 1882 but some 44,471 bottles and seven principal working mines against for—

	Principal Californian Mines.	Californian production. Bottles.	London Prices.
1876	21	75,074	£11 11 0 to £7 17 6
1877	21	79,396	9 10 0 to 7 2 6
1878	16	63,880	7 5 0 to 6 7 6
1879	16	73,684	8 15 0 to 5 17 6
1880	13	59,926	7 15 0 to 6 7 6
1881	9	60,851	7 0 0 to 6 2 6

To show that the assumption of about 44,471 bottles for 1882 is not a mere theoretical conjecture it is only necessary to give the Californian output for the first five months of this year—

	Jan.	Feb.	March	April	May	Total.
1882 ... bottles	3,900	2,894	3,208	3,529	4,891	18,420

Thus the actual receipts to date are 109 bottles below my hypothesis, 18,529, being 5-12ths (5 out of 12 months) of 44,471 bottles, and to clearly demonstrate the unremunerative range of prices during late years, a list of active and defunct Californian mines is an addition completely unanswerable, especially when a comparison is made with the prices of each year furnished in the above condensation—

Mines.	1881.	1880.	1879.	1878.	1877.	1876.
New Almaden	26,060	23,465	20,514	15,852	23,996	20,549
New Idria	2,775	3,209	4,425	5,138	6,316	7,272
Redington	2,194	2,139	4,516	6,686	9,399	9,183
Sulphur Bank*	11,152	10,706	9,249	9,465	10,993	8,367
Guadalupe*	5,228	6,670	15,540	9,072	6,241	7,381
Great Western	6,241	6,442	6,333	4,963	5,856	4,322
Napa Consolidated	5,552	4,416	3,605	3,049	2,229	573
Great Eastern	1,065	1,279	1,455	1,366	505	387
Cloverdale	208	—	—	18	116	1,028
Pope Valley	—	275	1,325	1,075	1,060	300
St. John	—	492	1,290	—	1,463	1,683
Attoona	—	245	1,919	1,534	1,317	1,979
Oceanic	—	—	779	1,699	2,575	2,358
Oakland	—	166	1,505	1,615	1,395	2,150
California	—	422	1,110	1,640	1,516	965
Sunderland	—	—	—	472	735	1,570
Abbott	—	—	—	—	836	1,436
Manhattan	—	—	—	—	439	976
Buckeye	—	—	—	—	466	407
Mr. Jackson	—	—	17	158	268	128
Bacon	—	—	—	—	150	150
Various Mines	376	—	84	—	350	1,910

* Not producing in 1882.

The above plainly elucidates that a measure of combination for an augmentation to value should be a negotiation of extreme facility and prove remunerative to those concerned, for without doubt the struggle for existence has proved so eliminating that the dwindled total of producers represents but the survival of the fittest, those best calculated for understanding the advantages of organisation by an intelligent grasping of the position. In December of last year the London stock was declared at 84,000 bottles, divisible, importers 13,000 bottles, second-hands 71,000; and the second-hand price since then having been always appreciably below that of importers, the greater share of the demand has presumably been supplied from their stock—little or no accretion has been made to same by speculators purchasing from importers, fresh operators availing themselves of the under-selling of those of their fraternity desirous of realising through various motives—therefore the appended Board of Trade returns of exports for the first five months of the present year are deserving of careful study, and when compared with similar periods of the two previous years afford data of a greatly increased consumption—

	1882.	1881.	1880.
January..... bottles	1,947	2,080	1,287
February.....	2,388	1,166	714
March.....	3,380	2,106	1,074
April.....	3,418	2,127	1,266
May.....	2,549	2,541	984
Total.....	13,682	10,020	5,325

On the 30th ultimo the United Kingdom exports had amounted to 13,682 bottles, which, with a home consumption of about 1000 bottles per month, will together total some 19,000 to that date, and, as before stated, the greater share of the demand has presumably been supplied from second-hands, then, in pursuance of this general opinion of the market, an allotment of $\frac{1}{4}$ to importers and $\frac{3}{4}$ to second-hands is a fair apportionment; thus reducing the stock declared in December last from 71,000 to some 58,400 bottles, a not excessive stock, especially when it is taken into account that most of the same was purchased at prices comparatively greatly above those lately ruling, and which are, moreover, enhanced by charges of interest, rent, and insurance; therefore it is not unreasonable to premise that the larger proportion is firmly held by strong holders who will not realise with the favourable statistical position now in development. Weak holders having seemingly been by this time weeded out, and the confirmation of this has, when endeavouring to buy under the importers price, become apparent latterly, for one finds that there is little or nothing on offer from second-hands. Stocks in importers hands are of no consequence to the market, as it is obvious that no great quantity will be allowed to pass to speculators at a price only touched once before the present year, during a research through the records of 32 previous ones. Indian gold mining, a demand to be reckoned on in the future, has to my regret proved more tardy in effective working than was at first expected, but taking into consideration the difficulties of access to the gold region the progress made has not been unsatisfactory, and before long crushing should be general. The South-East Wynaad, Rhodes Reef, and Phoenix trial crushings from surface stone exposed to destructive saturation from the land drainage of the monsoons are most encouraging, and predictive of very favourable results when the quartz below the surface influence is worked. However, the statistical position of quicksilver now renders a substantial increase of its value shortly independent of this source, but should my anticipations of this demand be verified the impetus will be all the greater.

INVESTIGATOR.
Ryndon, June 14.

THE CAPE COPPER MINES.

SIR,—When the vast capabilities of this magnificent property begin to be better understood then, and then only, will there be a general rush after the shares. They are only now beginning to attract general attention. The profits of the year will greatly exceed the total paid-up capital of 140,000*l.*, in all probability by some 10,000*l.* It is not saying too much to call Ookiep the champion copper mine of the world, as to the inexhaustible wealth of its deposits and to the richness of its ores. Then, again, Spectakel Mine yields ores of nearly half pure copper, worth, as ores at present price, 28*l.* to 30*l.* a ton, though in lesser quantity than Ookiep. Taking the surface indications as a guide, there may be a dozen such mines or more included in the mineral rights belonging to this now famous company, extending over 300 or 400 square miles. The dividend of 5*l.* per annum is a good one, but shareholders have but to wait a few years to see it nearly, if not quite, doubled. Unquestionably this is one of the most legitimate and most paying undertakings ever placed before the public. A return of 5*l.* per annum for every 7*l.* invested, with a prospect of 8*l.* or 10*l.*, shows how well our directors knew what they were about when they brought out the company.

The country they occupy has as yet been but very partially explored, and further discoveries may be made any day.
W. W.
June 14.

INDIAN GOLD MINES—TREATMENT OF PYRITES.

SIR,—In last week's *Mining Journal* I read "Indian Shareholder's" letter on the Wynaad gold mines, reporting a wonderful discovery, claimed to have been invented by Mr. Moore, for treating pyrites with chlorine for the extraction of gold, and for which he proposes to take out a patent. Allow me to inform "Indian Shareholder" and others interested in the Indian gold mines, through your valuable *Journal*, that the "chlorine process" was first introduced by Plattner very many years ago, and is known amongst amalgamators or reduction officers as "Plattner's process." It was adopted and worked successfully at many mills at Grass Valley, and at very many other mining districts in California 10 or 12 years ago. The chlorine is obtained from sulphuric acid, salt, and manganese, or from manganese and hydrochloric acid; and the advantages of adopting this process will depend on the prices of these articles and cost of getting them to the mines. If the pyrites is auriferous there should be no difficulty in extracting the gold with proper appliances, if fire, wood, or coals can be got at a reasonable price, and a plentiful supply of clear water. For extracting gold by the chlorine process the pyrites must first be desulphurised.

OOREGUM GOLD MINE.

SIR,—It is gratifying to find that the statements made by Capt. Bryant and myself are being gradually substantiated by the course of events. Our traducers, from the admissions they are forced to make, are becoming the best witnesses for our defence, and if there ever was a doubt as to our *bona fides* it is fast being dispelled. Our critics have but clumsily veiled the "puff" intended for themselves, they have been loud both in condemnation and advice, the worth of which may be gathered from the following:—"Mr. St. Stephens, writing as the agent of Messrs. Arbuthnot and Co., on Jan. 10, which letter appeared in the *Mining Journal* of March 4 last, said as follows:—"I recommend that no trial works should be commenced until the above-mentioned shafts (Munday and East Main) had been sunk to the depth suggested (20 to 25 fms.), when the regular formation, &c., &c." "A nearer approach to this desirable calculation (the quantity of rock) might now be within our power had it been judged advisable to proceed continuously since February last with the East Main and Munday shaft solely, as strongly recommended by me, instead of dividing the labour by opening out so many prospecting pits which, as before observed, had finally to be abandoned as furnishing no indication of any remunerative lodes being contiguous." "In May next I hope such favourable and regular stratified rock will be met with as to enable short cross-outs being driven to intersect the three reefs."

Capt. Bryant resigned and left India on April 21, and Mr. St. Stephens was appointed as manager in his place; his first report after taking over the mine appeared in the *Mining Journal* of Saturday last, and among other things he says: "On taking over charge of the mine I immediately took steps to open out the reef near the wigwam (q. bungalow.) . . . I have set the ground, after sinking by the side of the reef for 9 ft. 6 in., at the price of Rs. 10 for the first two fathoms."

Comment on this (further than to say that the price he has contracted to pay is much in excess of that paid by me for similar work) would be superfluous, though it might be asked, has he failed to find what he led the shareholders to believe would be found in the East Main and Munday shafts, when his advice was taken in opposition to that of Capt. Bryant? Seeing that he now acts diametrically opposite to the advice he gave when acting as the consulting engineer to a firm of merchants and bankers, how is it that his last report is silent respecting the East Main and Munday's? Is it that his confidence is shaken in his ability to find the "big reef" that he has begun prospecting, in order that when the time comes for admitting the failure of his pet prophecy, he may be able to say, "never mind what I told you about the Maharajah reef, the champion lode, surface slides, and the want of continuity at shallow depths, I have been looking about, and have found something just as good, and if you only wait it will be all right?"

Mr. St. Stephens would not be the first, and probably would not be the last man, who has shown a wonderful proficiency in criticising the work of others, but who have proved themselves utter failures when placed in the position of those whose abilities they scoffed at—Ranajee Steffjee, the "Censor," saw stone at Ooregum that would assay 40 ozs. to the ton; R. St. Stephens, the manager of Ooregum Mine, modestly contents himself with recording that he had seen a very pretty show.

F. KENSINGTON,

Late Superintendent.

Penwortham, Preston, Lancashire, June 12.

MINING ENTERPRISE ON THE GOLD COAST—AKANKOO.

SIR,—My attention has been drawn to an article which appeared in last week's *Journal* signed "Patience." The shareholders in general appear to have no idea of the extent and wealth of the above property. I was one of the prospecting expedition, and stayed several weeks upon the concession, and presume a short description will be acceptable to all interested. The Akankoo or principal reef is well defined, and solid, and crops out on the surface for over a quarter of a mile in that distance. It varies from $\frac{1}{4}$ to 26 ft. in thickness. At the highest elevation, which has been named Ponsonby Hill, it there reaches its greatest thickness, and appears to be the junction of several reefs, the principal of which runs along a spur of the hill due north. A great amount of labour has been done on it by the natives, which satisfactorily proves that it contains payable gold. A little to the south of west at the western side of the hill (Ponsonby) another reef can be traced for nearly half a mile, which dips a short distance from the Ponsonby outcrop. On taking the straight line of the reef it makes right for it. The stone looks very good, and of considerable thickness (3 ft.). The natives have wrought along the outcrop nearly the whole length, which leaves no question as to its auriferous quality. On the south-east side of the hill there are two other reefs not far apart, both bearing to the Ponsonby outcrop. The natives wrought both, and the stone looks well.

There are other reefs on the property which are large and look well. I wish to draw attention to the junction on Ponsonby Hill in the first place, because reefs are generally most productive at the junction, as well as the large body of stone, which is proved to be payable on the surface (9 dwts. per ton), and of itself quite a fortune. In the second place, because the natives have cleared away the surface from the face of the reef for a considerable distance along the outcrop to the depth of about 20 ft., proving rich deposits there, and showing the reef at this point descends almost perpendicularly. From this point they have sunk a line of shafts 150 yards in length, nearly at right angles to the line of reef; the upper, or shaft next the reef, is 15 ft. deep, and the farthest off 85 ft. deep, by which it appears to me that the natives were on a run of alluvial, taking its rise at the outcrop. The first shaft, which is 40 ft. from the reef, and only 15 ft. deep, could not have bottomed near the reef or casing, because the reef goes down almost perpendicularly, and besides I could find no portions of mica and clay-slate in the mullock brought up, which would have been the case had they come upon casing or wall of the reef. I quite agree with Capt. Burton and Commander Cameron that rich deposits of alluvial may be found in the hills and elsewhere, more so in the valleys, and in all likelihood about the junction on Ponsonby Hill. Go where you will indications of alluvial will be got, and try where you will gold will be found less or more. Whenever the alluvial in the valley is bottomed I look for immense deposits of gold, and if that valley existed in Australia it would not be long before hundreds if not thousands of miners would be located in it. In my wanderings one evening I came upon a small water-course, much flooded at the time, and so very promising that I could not resist trying a prospect. Having no dish I put a handfull of drift upon a plain leaf and washed a very fair prospect in presence of Mr. Lowman, another of the prospecting party. I returned next day with a cradle, but found the place so flooded I could not work.

There are hundreds of acres of surface which I believe would pay for working even with puddling machines (the ground is not suitable for hydraulic to level). It has been all pigrooted, and knocked about by the natives; where I saw it cut through there were from 2 to 3 ft. of alluvial, and the prospect washed by a native would go from 3 to 5 dwts. per ton, which would yield a handsome dividend, besides the chance of falling upon rich patches, sure to happen, as the ground would be wrought in a face, and, as before stated, when the rock or hard ground at the bottom of the valley is reached there will be immense finds of gold; but, as stated by "Patience" in last week's *Journal*, I am of the opinion the rich lodes should be opened up first, and the machinery set going, as is now being done with the greatest dispatch, the expense of puddling machinery for the alluvial will be a small matter, and can, if desired, be set up when the crushing machine is in order. I trust I have pointed out sufficient to satisfy those interested as to the extent and richness of the Akankoo property, leaving aside altogether the many natural advantages and abundance of good water, all of great importance in gold mining. The shareholders may rest assured that gold is there in abundance to make the concession a financial success.—*Ealing, June 14.*

J. B. R.

GOLD AND DIAMOND MINING IN SOUTH AFRICA.

SIR,—The principal event of the week has been the amalgamation of all the claims in Otto's Kopje for the purpose of working them by one company under the Companies Act of 1862. The shareholders have appointed as directors seven good practical men, and it is generally thought the concern will be a great success. Otto's Kopje contains about 704 claims of 30 ft. square, or 693,600 square feet, equal to a payable lode 3 ft. broad and about 40 miles in length. Mr. Kilgour, the manager of the London and South African Exploration Company, in a report on Otto's Kopje dated April 3, 1882, says:—"With a comparatively low expenditure a company can be formed on a firm basis with a very small capital, which, united to the advantage of our enjoying the fruits of the experience of others, promises for Otto's Kopje a future more certain than that of any existing mine." He also places the ascertained value of the diamond soil at Otto's Kopje under very imperfect treatment at 25 per cent. above the value of the diamond soil at Bultfontein or Dutoitspan Mines. Such a statement from the representative of two rival mines ought to speak volumes in favour of Otto's Kopje. But for my own part I think it rather premature to give such a decided opinion on an untried property.

The De Beers Mining Company have issued their yearly balance-sheet, and have declared a dividend for the half-year of 3 per cent. With proper management they ought to be able to pay 16 per cent. for the next 12 months. Owing to the drop in the price of diamonds business throughout the diamond fields is very dull, nevertheless the price of shares in all our good companies remains unaltered. Most of the speculative concerns are suffering severely. Three large companies in the Dutoitspan formation have suspended operations, and several others in Dutoitspan and Bultfontein are about to follow. Bad management and the way the mining companies are handicapped by the London and South African Exploration Company is the chief cause of failure. At Koffyfontein every company has suspended operations in consequence of the numerous swarms of thieves that infest the place. It is reported that the villains steal fully 40 per cent. of all the companies diamonds, and as a natural consequence the companies are obliged to stop work. Those illicit diamond-buying thieves are the lowest in morals of the human (?) race; they have been known to rob a Kaffir of his coat and sell it to another Kaffir for 2s. 6d., and they have been known to rob a little girl of 4s. 6d. when on her way to the chemist to get a bottle of medicine for a fever stricken mother, her only parent.

The reef around the Kimberley Mine is again very troublesome; the south-east is all on the move, the north-east is getting dangerous, and at the north-west a new crack has opened 112 ft. from the edge of the mine, and threatens to fall into the Central Company's claims. The Central, British, and Barnato Companies are taking out very large quantities of diamonds, and even with the present price of diamonds are earning large dividends.

There is a great deal of sickness here just now, the number of deaths for April being about double that of the corresponding month of last year. Murders are on the increase, and crime amongst what ought to be the respectable portion of the community is distressing to think of. Secretaries of companies with salaries of from 600*l.* per annum upwards transported for robbing their employers of 1600*l.* worth of diamonds. The engineer of the Mining Board with a salary of 900*l.* per annum committed for embezzlement and forgery, and the Town Clerk, who is also a J.P. with a salary of 800*l.* per annum, undergoing his preliminary examination for the embezzlement of a very large sum of money, and a large number of agents and brokers in the same fix is a proof that there is something radically wrong in this place. It is my opinion that these irregularities as well as most of our other troubles must be placed to the credit of the company mania of last year. At Kamfersdam they are finding some very nice diamonds, but as yet they are not quite paying expenses. They are steadily improving, and when they get a full supply of water they ought to do very well.

The fighting in Mankoroane's territory is of the most sanguinary character. The battle in which the Boers threatened to exterminate Mankoroane's people was fought on Sunday last, and contrary to expectations it resulted in a victory for our faithful old ally. The battle took place near Taungs, and seven Boers and a large number of Kaffirs were left dead on the field. Mankoroane also captured over 500 head of cattle. From the Transvaal gold fields the news is of a very unsatisfactory character. The firm of Holland, Benjamin, and Jorison have been to the fields, and threatened the diggers that if they do not give up their claims they will give them a taste of Bronkhurst Sprint. In fact it is a common occurrence throughout the Transvaal now if an Englishman offends a Boer to be threatened with Bronkhurst Sprint. Throughout the Transvaal at the present moment the utmost corruption prevails. Not a letter passes through the post office that is not liable to be opened, and the majority of Englishmen's letters are opened. If the letters contain any information of intrinsic value the Government officials communicate it to their friends and divide the profits. All letters from private individuals to the British resident complaining of unlawful treatment are destroyed, so that "happy George," as Jorison, Joubert, and Co. facetiously call him, is allowed to pass his time in rest and quietness. During the last few days several enterprising mine makers have arrived here from the Transvaal with lots of various kinds of samples, which look as if they had been worn smooth by passing through several generations of trousers pockets. They are not likely to swindle any person here, and therefore they propose trying Europe.

Kimberley, May 21.

CORRESPONDENT.

MINING IN SOUTH AUSTRALIA.

SIR,—I regret I have only time for a short letter by this mail, but mining, more especially in gold, is making such great progress just now that it would be a pity not to keep your readers posted up in what is being done. Since my last several new discoveries have been made especially in the neighbourhood of Echunga, which for nearly 30 years has been worked as a gold field. Though of comparatively limited extent, covering only about 10 or 12 square miles, a considerable quantity of gold from first to last has been raised from only a small area within the limits of the auriferous country. A few years ago some attempts were made at working the reefs existing in the locality, but none of them turned out very successful. During the past nine months, however, this kind of gold mining has revived, and having been pushed forward with energy some really good discoveries have resulted, proving the district to be as rich in auriferous quartz lodes as it ever was in alluvial gold. The first crushing of any consequence is now proceeding on the ground of the Echunga Gold Mining Company, and the cleaning up of the battery will take place in two or three days. The result is with good reason expected to be satisfactory. Reefing is now going on over a considerable area of ground, and some of the quartz bids fair to yield 2 ozs. or more of gold to the ton. In fact many specimens far richer than this are to be seen, and some persons aver that crushing of 5 ozs. to the ton may be got. In other localities also the development of our gold

reefs is going on briskly, and several of the companies are so satisfied with the prospects that they are ordering machinery. Before six months more it is probable that we shall prove to the satisfaction of the rest of the world that we are as rich in gold as in other metals.

The tin discovery near Encounter Bay is said to be turning out well, and others are in course of being opened up. The copper mines near the present terminus of the Port Augusta Railway at Farina are exceedingly rich, and contain very productive lodes of ore. There is some probability that a share in them may be offered to English capitalists before long. Your interesting notice of the new alloy, Malleable White Bronze, in the *Mining Journal* of March 18 leads me to remark that we have abundance of manganese in the colony, and I have secured about 500 acres which contains large lodes of it, admirably situated either for shipping or smelting on the mines. This new discovery should affect the price of copper as well as open up a good market for manganese. We have had splendid rains during the past fortnight, and everything is improving in consequence.

Adelaide, May 4. J. B. AUSTIN.

NEW QUEBRADA COMPANY.

SIR,—The suggestion of "An Old Shareholder" in last week's *Journal* as regards the construction of a pier seems feasible, but never having been on the spot I must leave others to judge. However, I must say that with respect to the management my views coincide with your former correspondents. I am a comparatively young shareholder, and simply bought my shares at the recommendation of a friend, who told me as the railway was completed it would be a good investment. I paid the full price, and shortly afterwards they went up to a premium, but although we have been extracting considerably over 2000 tons per month, and our sales have been regular, the shares receded, and have been fluctuating between 1 to 4½, and two small dividends have been paid of 2s. 6d. and 3s. per share respectively. Upon looking more closely into matters I find that not only do we have to pay a high rate of carriage, but a royalty of 5 per cent. on the gross to the promoters of the railway, and a further royalty on the ore of 1-25th, less certain deductions, and that a considerable sum we were told by the Chairman last year was set aside to meet the same, yet not one word appeared in the accounts to this effect, and it came to my knowledge for the first time, and I have no doubt there are scores of other shareholders who are ignorant of the above facts. Unless the accounts are more clear and satisfactory I shall certainly vote with "E. L." that a committee of inspection be appointed.

— A YOUNG SHAREHOLDER.

LEAD MINING.

SIR,—The long desired improvement in the quotations of lead is at length being accomplished, and, as a consequence, well-known productive and genuine lead properties which have been for some time unduly depressed are attracting considerable attention; the shares in such undertakings have during the last week been eagerly bought up at the minimum prices by investors, who know how to take advantage of adverse and improving circumstances. Many lead mines in the Principality will find, as well as English properties, the effects of the change. The continuous and regular sales of lead ores of the Bwlch United Mines, the last 20 tons on Saturday at about 310l. has created a demand for these shares as might have been confidently expected.

Enquiries have been active for the Talybont shares, where the now nearly completed machinery will shortly enable most satisfactory returns to be recorded. The recent improvement in the Cambrian Mines in produce as well as management will attract investors. The rise in lead will also be much in favour of the East Wheal Rose, where rich silver-lead ores will most certainly meet an excellent price. It has long been a vexed question whether the ores from this mine, the Maun Mines, or the Goginan and Bwlch series are the richer in the precious metal. Actual simultaneous sales will soon now prove the fact.

— AN OLD LEAD MINER.

THE PRICE OF LEAD, AND LEAD SHAREHOLDERS.

SIR,—As a large investor in mines, I look carefully for any suggestion that might reasonably be expected to improve the position of our lead mines, and must enter my protest against the plan set forth by Mr. Absalom Francis in last week's *Journal*. Results brought about by combination to curtail the production of our rich mines would in no way improve our position; its only results would be for a time to cause an artificial scarcity of lead, a fictitious price, giving no profit to the rich mines, raising "only the quantity of lead ore that their leases compel them to do;" but, on the other hand, enabling a thousand and one poor valueless mines to be started (and companies floated to the profit of the promoters and reporting agents, and certain loss to the shareholders) producing lead costing as much per cwt. as it will sell for per ton, thus flooding again the market with lead, as it has been, at the cost of the investing public.

The only true business plan is let all mines that will not pay stop working. (I am sorry to say I am in a few). Mines are started on the faith of reports giving them fictitious value, in which there is no chance of making a profit by working, the only people benefited being the agents getting good salaries, the officers, and the merchants. We have had patience now for a few years, and our prospects are brighter than of late. It is to be hoped that ere this year is out lead mines will have better times, more particularly those mines that have in them the germ of success (all have not). There are two classes of mines that will pay—first, properly managed mines that give large returns of ordinary ore like, say, Van, Roman Gravel, Great Lacey, or good returns of rich silver-lead ore like South Darren, East Chilverton, and others. Second, mines like Tankerville and Great Consols that do away with useless officers and offices, working an extensive run of mines under one able management and office expense. These are the only classes of mines that shareholders can ever hope to get dividends from. Curtailing produce with the object of getting fictitious prices never will do good to mining; a good mine can be swamped by expensive management or injudicious working, but as a rule a valuable mine will take care of itself without the aid of a rigged lead market by an unbusinesslike combination. The future the lead trade is full of promise for good mines, and ere this year is out lead will see a price high enough to give profits to lead mines, and yet keep low enough to check promoters foisting shams on the public.—Wakefield, June 12. JNO. B.

NEW TERRAS MINE—ITS HISTORY AND PROSPECTS.

SIR,—This extraordinary mineral property was discovered in the year 1864 by Capt. James Hocking, who found a large counter lode or dyke containing 1 cwt. of black tin to the 100 sacks close to the surface, as broken without selection, and the deeper he went the richer he found it to become. It was taken in hand by some local people, who erected a small battery of stamps, which was driven by a small stream. After selling 293l. worth of tin a company was formed with a capital of 25,000l., in 25,000 1l. shares. From the commencement of this company the shares were "rigged," and from 1l. per share they reached 7l. per share; but very little of the capital was appropriated to the working of the mine. The management was also of the most wild and extravagant character. It soon became apparent that the company could not long exist under that management. The stuff was carried to the stamps without any regard to selection of the tinstone, and many thousands of tons of stuff of a worthless character were stamped; but, notwithstanding this, in about two years from the formation of the company, after laying out dressing-floors, erecting engine and sundry preparatory works, more than 7000l. worth of tin was sold, and above 2000l. paid in dividends to the shareholders. Expensive machinery was erected in other parts of the mine, which, with heavy charges for management, exhausted the whole of the available capital. Some of the machinery erected was of a very imperfect character, it having been put up by patentees for trials, and which became a burden to the company. The company having lost confidence in the management declined to supply any further capital, so the mine came to "grief." A little more than twelve months ago Messrs. James and Co., the well-known mining engineers, whose family have been connected with Cornish mining for more than a century, were induced by some of the local shareholders to take the matter in hand, and to form a com-

pany with a capital of 35,000l., in 17,500 shares of 2l. each, of which 2s. 6d. is to be paid on application, and 2s. 6d. on allotment of shares, and the balance by instalments of 2s. 6d. per share at intervals of three months. No cash is paid to any person other than the actual out-of-pocket expenses. Therefore the new company starts clear of any cash burthens, and have the advantage of all the exploratory works done by the late company, which cost a large sum of money. The tin ground opened up by that company is estimated to be at least 200,000 cubic fathoms, and the profits to be derived therefrom under the present manager will not, it is thought, fall short of 500,000l. There is no mine in Cornwall with better prospects, and no mine can more favourably compare with the returns made by the old company in the short period it worked, for the extent of the work done, and considering the bad management in the doing it.

A large number of shares in the new company are held in Cornwall, and the company will be managed by a local committee, and we look forward to see the New Terras, at no distant date, in the Dividend-list.—June 12. MINER.

NEW TERRAS MINE.

SIR,—The re-working of this mine is looked forward to with great interest. All who know the property speak of it in the highest terms; indeed it can hardly at present be called a mine, because all the works are open to daylight. It may be designated "quarrying for tin." One of the great features of this property is the extraordinary productive elvan course extending through the whole length of the sett, which is impregnated with tin, more or less, throughout its width, which varies from 15 to 25 ft. At a depth of 15 fms. it is found to be 25 ft. wide, and for the whole of that width the contents will produce from 15 to 20 lbs. of black tin per ton of stuff, while selected portions will yield as much as 200 lbs. of tin per ton of stuff. These are practical facts given as the result of a few months' working for the returns of over 7000l. in a most unmineral-like manner, thousands of tons of rubbish having been stamped. Let us consider the result which will accrue from a judicious development of the tin course. Practical men have estimated the tin ground, which is partly laid open, to contain at least 200,000 cubic fathoms, and the average produce at 15 lbs. to the ton only; each cubic fathom will give 15 tons, or at least over 1,000,000l. sterling of reserves. A large number of shares are held by people in Cornwall who hold the mine in high estimation.—Truro, June 12. R. S.

EAST WHEEL ROSE, AND ITS DEVELOPMENT.

SIR,—In last week's *Journal* is a report of the capital start made by the East Wheel Rose engine. I trust it will be a sure prelude to the successful development of that rich property. I was invited by a friend, a mining captain in the immediate neighbourhood, to come (as he had had an invitation) to see the start made, and so arriving in Truro by the early train I got to Newlyn East about ten o'clock, and had ample time to see the property accompanied by my friend, and to examine for myself the mineral being got from Innes lode, and also the progress made in the development of the mines, and in the erection of machinery, before the great event of the day occurred; and truly the progress made is something remarkable. To see the extent of the property, the size of the buildings, the substantial erections, and the general activity would do any shareholder good. From the humblest toiler to the chief engineer you meet with the utmost courtesy, and each and all are full of hope for the future prosperity of the company. Surely it is a great undertaking, and shareholders must have patience. Delay there has been, but that is not the fault of the directors; the delay has arisen from inability to supply the machinery in the given time, and that delay is a serious one; and it is this only that has caused doubts of the ultimate success of the company. But all are full of hope now the engine has made so grand a start, and the burst of applause which greeted the Chairman of the company when he said that the directors were determined to carry the mines to the winning post, speaks well for the zeal of those concerned. From the miner to the engineer I received evidences of the great value of the lodes, and that the riches still to be got would make the property a still richer East Wheel Rose than it ever was. I can only say that my visit was highly satisfactory, and has removed many doubts that clung to me from statements made in opposition to the company. What I would urge my fellow-shareholders to do would be to visit the mines themselves. I then on Monday went to Shepherd's, and the same activity, the same earnest endeavour to obtain the riches buried below, the same substantial erections, and the same desire to give every information was observable. When we judge of the length of adit opened out, shafts re-opened, engines and buildings erected one wonders how so much real good work could be done in so little time. As one in the engineering business myself, I have been surprised at the labour performed. And at Mounts Bay the same progress meets the eye. The extent of Sydney Cove puzzled me. I was informed by an eminent mining engineer that it was a small mine! Why, it is nearly a mile, if not more, in length, and nearly three-quarters in width. I went underground and examined for myself work done, and size of lodes and adit cleaned, and was much gratified by what I saw. At Pembro everything also is going on well, and the mine, as with Sydney Cove, is likely to turn out very rich. I saw the back of Great Wheal Vor lode in Sydney Cove, and it looks most promising. In Trebarvah they are getting another mass of copper for market, and in a fortnight they may sell again about 30 tons of copper ore.

My visit to Mounts Bay Consols was a most pleasant one, and as in the case of Capt. Doidge at East Wheel Rose and Capt. Nancarrow at Old Shepherds Mine, I received the greatest assistance from Capt. Argall at Mounts Bay. Immediately on my expressing a desire to see the mines underground a suit of clothes was provided for me, and every facility to judge and act for myself; and the result of my investigation and enquiries amongst the miners and inhabitants generally was most favourable. I then went to Tresavean. This is a grand old mine, and I believe from evidence daily accumulating that there is another Dolcoath for the shareholders. An old miner living in the neighbourhood asserted that when it was working it worked only for copper, but that he broke masses of tin one month by blasting, which realised him 30l. and his partner 30l. Yet all this tin is still left intact for the present company. It is the opinion of the agent, Mr. James, that Tresavean is one of the mines that will pay the first. The draining is proceeding with the greatest rapidity; every eight hours 2 ft. of water is let down, or at the rate of 1 fm. per diem. I trust that the energy and vigour displayed by the management will soon have their reward, and in spite of the low prices of shares ruling the market we shall each as shareholders reap the reward of patience, industry, and perseverance. The directors are determined to carry them to the winning point. Let the shareholders be firm and united in assisting them to bring about the desired results.

Bath, June 13. N. P.

EARLY RECOLLECTIONS AND RECENT EVENTS.

SIR,—Your correspondent, Mr. John Lean, writes with great spirit as though I had inflicted on him a serious personal injury. My "reminiscences" can have injured no living person, nor the memory of any dead. It is no disgrace for a man to be a carpenter, a cooper, a blacksmith, or a labourer in any honest calling; and the late Mr. Collan Harvey was not ashamed to acknowledge himself a cooper up to the date of his relinquishment of business at St. Day. I know that some proud persons are ashamed to have it known that they commenced life as mechanics; but a man of sound sense is not ashamed to acknowledge that he was at one time a tributer in Wheal Basset, nor is there any reason for it when a man is honest in his calling. If my communications had attacked the characters of the persons named therein, Mr. Lean might fairly exercise himself in severe criticisms thereon; but I have done nothing of the kind, and my letters have elicited from many expressions of the pleasure and amusement they have felt in reading them; and have advised the publication of a volume containing all my "reminiscences."

With regard to the murder of Mr. Rouse, near Wheal Bury, 50 or 60 years ago, I wrote as I was informed. It was not necessary that Mr. Lean should speak well, and most correctly, of the goodness of the Williamses of Scorrier House, because I knew them to have been

the benefactors of Gwennap, and the whole district around, by opening up numerous mines and other works, thereby giving employment to thousands of hands. When I went to Gwennap to reside in January, 1827, they had the management of the following mines:—Poldice, Wheal Maiden, United Mines, Tingtang, Wheal Damsel, East Wheal Damsel, Carharrack, Wheal Jewell, Wheal Gortland, Treskerby, and Wheal Chance, Cardrew, &c., in that locality, besides numerous others in other parts of the county and in Ireland, nearly all of which were profitable, and added to the wealth of that truly respectable family, and we all know that the members of the family have amassed vast wealth, more especially within the present century. The personal estate of the late Mr. J. Michael Williams was sworn under 1,600,000l., and his lands were worth nearly as much. In seven years he appropriated 700,000l. in the purchase of freehold lands in St. Columb, St. Ervan, St. Issey, Stithians, Wendron, Veyan, and several other parishes.

Of that family I must speak with grateful feelings because, when I went to Gwennap in 1827, Messrs. J. Williams and Sons kindly took me by the hand, by giving me employment in my avocation for a considerable time, till, in fact, I was in a position to get on without their aid. It was far from my intention to write a word disrespectful of the late Mr. Michael Williams, who, like other members of the family, was as honourable as he was rich; but miners sometimes take umbrage against the best of men.

"Well do I remember when 'R. S.' first put in an appearance at Gwennap—a stranger; no one knew who he was, nor whence he came." So says Mr. Lean. Does his ignorance concerning my antecedents reflect any discredit on me? I may retort in this way: "I knew Mr. John Lean when he resided in Truro a few years ago; but whence he came I know not, but I understand that he is now resident in London." It is not likely that Messrs. Williams would have patronised me if they were not satisfied that my character was good. I came from an honest stock—neither rich nor poor, and that is just my present experience, and I am thankful that it is so well with me. I neither expect or desire to be rich.

R. S.

June 12.

MINING IN WALES.

SIR,—I am glad to notice the remarks that have appeared in the *Journal* under the above heading, and as I have many years' experience of the mining districts can with confidence bear out what appeared in the *Journal* of June 10. The neighbouring mines have been for a time neglected, but now they are beginning to be developed. Several parties have taken up properties for the purpose of testing and to prove the wealth of these mines. Investors would do well in looking up to Welsh mines for realising large profits.

Dolgelly, June 13. T. J. E.

TREATING AND UTILISING FIBROUS PEAT.

SIR,—Referring to the notice which appeared in the *Journal* of May 27 under the above heading, and in which the utilisation of fibrous peat for the bedding of horses and other animals is ascribed to the invention of Mr. J. A. London, permit me to inform you that this statement is inaccurate. This new adaptation of peat was first discovered and made use of in 1878, in which year a patent was taken out in the joint names of Mr. George Edwards, of Malpas, and myself, entitled "A New or Improved Bedding for Horses and other animals." The mode of preparation, although differing in slight details, was substantially the same as that detailed in your columns.—Chester, June 14. EDWARD R. KNOWLES.

CHEAP METROPOLITAN LOCOMOTION—HALF-PENNY ALL THE WAY TRAM FARE.

SIR,—My plan of Metropolitan conveyance by horse traction, destined to supplant existing tramways, burdened with a heavy dead weight for permanent way, maintenance, Parliamentary, and preliminary expenses, of which proposed system, engendering equal traction outcome, is entirely devoid, consists in the appliance of wheels, forming an endless railway (not a self-laying tramway), with circulation as ordinary omnibuses, and removing an immense obstruction and danger to crowded street traffic, the permanent way of existing tramway companies. It is inconceivable how the public submit to be compelled to give way with heavy loads every few minutes to a passing tram-car. My calculations are based upon an excess of cost for horses and their keep by existing tramway companies. Rolling-stock, computed in accordance with the American cost and delivery in London; working expenses; horse-keep, as preceded; repairs, 5 per cent. per annum; redemption, 10 per cent. per annum; drivers and conductors, with double shifts 6s. per 12 hours' duty, passive or effective; management amply provided for; number of trips, as per tramway companies performance for identical routes, with exemption from bridges embargo, so adversely affecting the South London Tramways Company. Fare, one half-penny for all distances, resulting in an outcome of 20 per cent. dividend per annum on invested capital—the most minute elucidation of which at hand.

The natural consequence by the adoption of same by—1. An existing omnibus company would place in their power a dual means of conveyance, satisfying the cravings of the most impetuous simultaneously with the fastidious exigencies of the rampant parvenus, not oblivious of due regard to the requirements of the legitimately exclusive classes. A monopoly of the traffic upon a vastly augmented basis to the aggregate short-distance Metropolitan transit of ten railways encircling the domain of the Corporation and Board of Works, as well as combined omnibus, train, and steamboat traffic would ensue. Some hundreds of hansom would retire from rendering the streets of the Metropolis fraught with danger to the most cautious pedestrians, by reason of an accelerated omnibus traffic at enhanced fares.—2. The tramway companies, awakened to the reality of their traffic being doomed, possess a "planche de sauvetage" in adopting proposed system, to which their stud, stabling, &c., with bodies of their cars are applicable—their permanent way remaining to be taken up and sold for what it may bring.—3. The railways would possess an immense feeder to their trunk lines, as well in the Metropolis as in the provinces. Proposed system would create a link line between the termini of all railways abutting on the Metropolis, as well for passengers as for goods. All these interests are deeply concerned, and it is a matter for serious consideration which to apply to first. In this era of progress cheap locomotion is deplorably in the background.—Little Tower-street, June 9. W. J. THOMPSON.

BOILERMAKERS' READY RECKONER.—The risk of inaccuracy in making close calculations when performing it may be heavy manual labour is acknowledged, and it is also well known that accuracy frequently leads to considerable saving of material, or, at least, prevents unnecessary loss, boiler-makers will, therefore, readily recognise the value of Mr. COURTNEY'S Boilermakers' Ready Reckoner, with examples of practical geometry and templating for the use of platers, smiths, and riveters, the new edition of which has just been issued by Messrs. Crosby Lockwood and Co., revised by Mr. D. K. Clark, C.E. The geometrical portion is at once concise and useful, and there are 22 tables, which will meet every calculation. The tables are clearly printed, and so arranged that they can be referred to with the greatest facility, so that it cannot be doubted that they will be generally appreciated and much used.

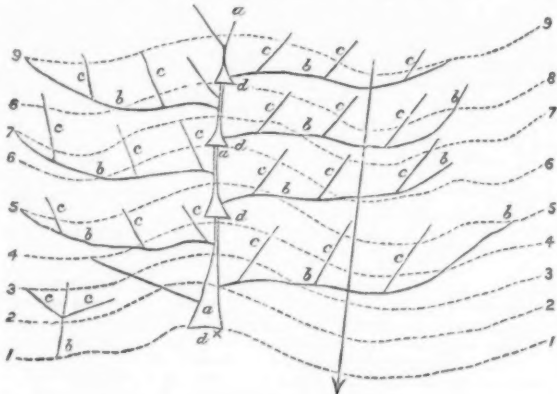
HISTORY FROM COINS.—During the session of 1881 an interesting paper was read before the Royal Historical Society by Dr. Hyde Clarke, but as his researches were then uncompleted, it has since been more than once re-written in order to introduce later observations, and is now issued in a revised and extended form—"The Early History of the Mediterranean Populations, &c., in their Migrations and Settlements, illustrated from Autonomous Coins, Gems, Inscriptions, &c." By Hyde Clarke, F.R.H.S. London: Trübner and Co., Ludgate Hill—and contains suggestions and observations which will prove extremely valuable alike to the paleophilologist, the numismatist, and the historian. He shows that the ancient town names throughout the Old World (and America must be added) are formed on one plan, and that where we have coins these town names have the sound of the names of animals and other objects, which were used as the emblems of those towns. Although at first sight such researches may

appear comparatively unimportant it soon becomes evident that Dr. Hyde Clarke is fully justified in stating that such researches enable us to correct or more clearly understand the loose statements of historians. The tables of cities, of common names, and of coins, and of cities with their coins and emblems, which occupy two-thirds of the volume, certainly appear to fully substantiate the author's conclusions, and it can scarcely be doubted that continued research will make these data as reliable in history as are fossil remains in geology at the present time. Dr. Hyde Clarke may certainly be congratulated upon the important results which his labours have thus far produced.

SOME REMARKS ON THE PROFITABLE EXTRACTION OF GOLD FROM SUPERFICIAL DEPOSITS IN WILD TROPICAL COUNTRIES—No. VIII.*

BY GUSTAV JULIUS GUNTHER.

In my last I alluded to country deposits, and I feel it necessary for the sake of a clearer understanding to give a definition of these deposits. They are neither the decomposed backs of auriferous rock channels, nor could they be classified among water-wear or placer deposits; although considered from the point of view of their origin they stand in relation to both. They have originated from rock decomposition, and may in the course of ages develop themselves into the latter. Their mode of occurrence is rather irregular; they occur in streaks, patches, &c., of a greatly variable auriferous density, and with great irregularity of distribution. There is every reason to believe that their auriferous matrices occur within the non-auriferous country rock in the shape of more or less lenticular-shaped increscences, their general run being more or less parallel to the larger and more continuous auriferous deposit, of which they would be what the German miner calls, "trumengüge" lode fragments or lode companions, if we compare the auriferous rock channel to a lode. Owing to this presence, we find here and there the very surface soil to be auriferous. Although these deposits are far too irregularly distributed and often very poor, still their presence should by no means be ignored, and they might be worked with advantage collaterally with the larger deposits. Where water could be obtained from a high level then they might be worked continuously by small detachments of our working forces. Where there is no water thus obtainable, then we could only work them periodically by taking advantage of some meteorological peculiarities of the tropics—the heavy rainfalls during thunderstorms, and during the wet season, during which periods we find numerous rills of water running down everywhere where the ground is sloping, and we should take advantage of this circumstance by proceeding in the following manner. In Fig. IV. the arrow indicates the direction towards which the surface



of the ground is sloping; the figures 1, 2, 3, &c., indicate the level lines. In the middle part of the most concave portion of that sloping ground we cut a trench, *a*, which at the beginning need only be a small one, following the direction in which that indentation of the ground is sloping. This trench, *a*, would be the central or trunk trench, and into it are leading on the right and left side a series of branch trenches, *b*, *b*, which in their turn collect the water from the still smaller secondary branch trenches, *c*, *c*. The direction in which all these trenches are dug depends upon the nature of the surface shape of the ground, the condition being that all of these trenches have given to them sufficient fall, so that the water would readily flow within them towards the collecting trench, *a*. The purpose of this system of trenches is to collect all the main water into a larger body. If the ground is soft it might be worked while the rain is falling with hoes, the work not at all requiring skilled labour, the detritus brought into the trenches being scraped or pushed along with the water. In the main trench catch-pits, of a triangular shape, would be placed at convenient spots where the rubbish brought down by the water would be collected, slanting grates being placed over these pits by which the larger sized stones would be caught, which would be examined whether they contained gold, the worthless ones being thrown alongside the trenches. In this way we could concentrate gradually the whole auriferous surface stuff with comparatively little trouble and little expenditure of labour, the heavy rains, in fact, doing the greater part of the work for us; and we should work in this manner any portion of the surface so long as we obtain any gold therefrom. In the course of time the trenches would get deeper and wider, and at last we might leave the work to the action of the rain alone, looking only from time to time to the catching pits, and examining the detritus which has accumulated therein, and perhaps clearing the trenches here and there where portions of their sides have fallen in and choked them, &c.

Thanks to the well-considered and systematic manner which regulated our explorations from the very beginning (see previous papers under the same heading), we should find ourselves in possession of sufficient knowledge as to the situation and extent of such surface or top soil deposits which would have to be flushed down in the manner above indicated. Let us now bear in mind that our field of operation is situated in a wild, say, forest covered tract of country, far away from any settlement whence we might draw most of our provisions, so that we should have to grow the bulk of our supplies on the spot, planting forming hence an indispensable part of our activity. But then the clearings which we should have to carry out for that purpose we should not carry out from a farmer's point of view but from a miner's point of view. That is to say we should select these sites for clearing away the forest where our previous explorations have shown us that after we have reaped a year's crop we should find something more valuable under the soil. Experience teaches that forest-covered ground is always fertile for one or even more seasons, and we should hence select by preference that ground where there is a chance, or rather (owing to our exploration) a certainty of our making additional profits by means of the flushing operations above indicated, after we have cut down and burnt the wild after-crop of forest plants.† The laying bare of the roots of the tree stumps by means of such flushing operations would afford another if but small advantage, as we could without any additional labour besides that of transport, utilise those stumps for fuel and other purposes.

On quartz reefs I shall, perhaps, at some future time treat under a separate heading. The mode of their exploration depends altogether

on the nature of the quartz. A reef composed of a highly ferruginous, rather loose, and almost friable quartz would be explored in exactly the same manner as the auriferous rock channels treated on in my former papers. In quartz reefs of a very hard nature we should according to circumstances, have fewer trial pits, and at greater distances from each other, and in order to test the yield of the hard reef at greater depth, it would be more economical not to sink on the reef at all, but make our deeper pits alongside the reef in the softer rock, and cut into the reef from the bottom of the deeper pit then made.

REPORT FROM CORNWALL.

June 15.—Apart from the gratifying prospects induced by the advance in copper, to which we have already adverted, there is little to excite attention locally in either the metal or the share market. Tin has seemed on the verge of a substantial improvement now so long that interest appears to slacken, and there has been a disposition to put off the date of the fulfilment of the long anticipated rise. For ourselves we are not inclined at present to anticipate the realisation of our confident hopes ere the quarter has fairly turned. Now that there has been so much delay, it is quite certain that efforts will not be wanting to carry the present state of affairs over mid-summer, and if such efforts are only made in earnest they are certain to be successful. As for copper, there is a very strong and general belief that we have entered upon a period of revival in regard to this metal, and that copper mines will be prosecuted with more vigour and over a wider area. This is precisely what we forecast, and what we hold to be highly probable, but certainty on this head depends entirely upon the state of the standards for the next few weeks. There is, however, no reasonable ground for doubt that there is a very favourable turn of the tide in this direction.

Under the present general conditions of the country the interest in mining circles is chiefly excited and absorbed by the prospects of individual mines, changes in which keep the share market in a fairly lively state, and give some little scope for speculation. Whether these conditions of casual and alternate furor and depression tend always to the welfare of the mines concerned is a question that does not always seem capable of being satisfactorily answered, but as a rule a mine does not suffer much from being kept before the public.

It does not follow, however, that there is always a gain. Very few mines have had a more liberal share of criticism than Wheal Agar, but there is apparently no effect. Wheal Agar is Wheal Agar still, just on the verge of prosperity, but not reaching it—a very Tantalus among modern mines. Now attention is being called to it again. The question of the superior merits of mine management by a manager or by a committee has often been discussed, but without any definite conclusion. Indeed, this is inevitable, for everything depends upon circumstances, but as the other system has been tried so long at Wheal Agar without satisfactory results, would it not be just as well to give thoroughly independent management a trial? Assuredly something should be done.

The feeling against the rise in the third-class fares on the Great Western Railway is gathering strength, and there are all the signs of a formidable agitation. The changes made in the locality are alike sweeping and obnoxious, in some cases most ludicrous, as where second-class return fares are actually less than third. To the working population the matter is a very serious one, some of the largest proportionate changes being in the shortest distances. Some fears have been expressed lest a rise in goods rates should follow. That, however, is hardly likely, though the county has not yet the advantage of passenger competition; the steamers are an active element in keeping down the rates for goods, and this year have even competed with advantage in the carriage of the early vegetable produce, beating the rail to some points alike in time and in money, and this may be carried much further.

There seems no good reason why the attempt now being made to develop one of the most neglected forms of mineral wealth in South Devon should not be a thorough success. There are several points at which the slate rocks of the county contain runs of valuable stone for conversion into slate and slab, the demand for which is ever extending, and West Leigh bears a good name. Of course there is an element of speculation in slate quarrying as in mining, but for all that it is mainly a matter of direct evidence and sight. Neither in Devon nor in Cornwall, and particularly in the former county, is quarrying carried on commercially to anything like the extent it might and should be.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

June 15.—The coal trade continues in an unsatisfactory state, whether demand or price be considered. The miners are not making more than two-thirds time, and at some pits only half-time only is being run. List rates (Earl Dudley's) remain at 9s. 6d. per ton for furnace coal west of Dudley, and 10s. per ton east of Dudley, but such quotations are scarcely more than nominal. Plenty of A 1 furnace coal is to be had at 8s. 6d. and 8s. per ton. Meanwhile, the colliers are being paid wages based on the Earl of Dudley's highest figure. Thus the Thick coal men on the Dudley side of the district are getting 3s. 4d., and the Thin coal men 2s. 8d. per day or stint. Pig-iron consumers have, for the present, supplied their most pressing needs, having bought, some of them, in lots varying from 1000 to 3000 tons during the past two or three weeks. This week there is, therefore, less doing, and vendors are likewise standing out for stiffer rates; 47s. 6d. to 50s. is this week the average quotation for such part-mine foreign brands. Hematites are quiet at, in actual sales, 62s. 6d. to 65s.; but one or two vendors quote 67s. 6d. Cinder (Staffordshire) pigs are 40s. to 37s. 6d. per ton. Cold blast all-mine natives are 41. 5s. to 41. 7s. 6d. Finished iron is reviving somewhat in the bar branch. Marked bars stand at 81. 2s. 6d., and between this price and 61. for common bars quotations are very varied. Sheets are 81. 10s. to 91. for galvanising doubles, and hoops are 61. 17s.

It is understood that Messrs. Stanier and Company do not intend to renew their lease of the Silverdale Collieries, Newcastle, North Staffordshire, which expires in the present month. They will, however, continue to work their extensive collieries and ironstone mines at Apedale, where they have six blast furnaces of modern construction; and they have recently enlarged their forges and rolling mills at Knutton, where they will manufacture plates, bars, angles, tees, hoops, and other descriptions of finished iron. The Gorsty property at Silverdale, containing rich beds of ironstone, which was purchased by this firm some years ago, is in course of development, and this, with the ironstone mines in the Oak Colliery at Knutton, the coal and ironstone mines at Birch House, and the Park House Collieries, Chesterton, will be worked by Messrs. Stanier and Co. as usual.

Some satisfaction has been occasioned amongst the coal trade of the district by the more favourable tone apparent at the half-yearly meeting of the well-known Pelsall Coal and Iron Company. A discussion took place as to whether it would not be better to forego the 5 per cent. dividend recommended in the report until the stronger financial position into which the concern was now getting had become more confirmed, but the Chairman (Mr. G. W. Hastings, M.P.) said that the directors sincerely believed that they could offer a small dividend without damaging the interests of the concern. The dividend was therefore duly declared.

STEELMAKING FROM STAFFORDSHIRE IRON.—Mr. Benj. Hingley, of Netherton, has addressed the following letter to the Editor of the Birmingham Daily Post:—"Referring to your report in relation to the above, I wish to state that the practical men who witnessed the experiments on Friday last are not answerable for the figures mentioned in your report, but only for the expression of opinion that the soft metal produced is analogous to wrought-iron, and may in the course of time supersede puddling; further trials of a more exhaustive nature are necessary before a positive opinion can be formed—both as to its properties and adaptation for general use, and also as to the cost, but I feel sure that the 95s. per ton mentioned is considerably below the mark. Steel rails made by the same process from cheap Cleveland pig-iron cost about 51. 10s. per ton at works; therefore bar and sectional iron for general use must of necessity be much higher. There is no cause for alarm on the part of ironmasters as to any sudden revolution in the business, as

even if the new process should eventually prove to be successful, it will be the work of many years to bring it into general use."

REPORT FROM DERBYSHIRE AND YORKSHIRE.

June 17.—There has not been much change of late in the mining or iron trades of Derbyshire, and in some branches the men are anything but well employed. In the lead district business appears to be of a routine character, not being subject to sudden changes. Not much iron-stone is now being mined in Derbyshire, for the iron masters are paying more attention to that being worked close to the surface in Northamptonshire than they are to that close to them, which is probably fully as cheap, although there is a 70 mile carriage rate to pay. The deposits in the county of Rutland, which we were the first to call attention to, are now in a fair way of being developed. The coal trade is in anything but a healthy state. House coal does not go off at all well, and the prices of it are exceptionally low, even for the summer. Some of the collieries doing business with London have, however, done tolerably well of late, and Clay Cross last month sent there 20,600 tons, and Grassmoor 16,500 tons.

At the pits the price of coal for household purposes has been as low as 6s. per ton, if not lower, and when it is considered that some of the other and smaller sorts have to be sold at from 1s. 6d. to 3s. 6d. per ton, it will be evident that profits in most cases are out of the question. In London consumers are supplied with some descriptions of coal at from 18s. to 19s. per ton, delivered into the cellars, so that when the carriage and other expenses are deducted the actual cost of the coal at the pits can scarcely be one-third of what the consumer has to pay for it. Steam coal has gone off tolerably, but nothing like to the extent of what is being raised. The colliery owners have no near place of shipment, the same as those in South and West Yorkshire have, so that the former have to rely in a great measure upon the ironworks and railway companies for disposing of the hard or steam coal. Mr. Thompson has suggested a means by which the steam coal could be easily and cheaply sent to the Thames from Derbyshire and Nottinghamshire by rail and water, but it has not as yet received the support expected. There is a large output of pig along the course of the Midland line right into Nottinghamshire, where the two furnaces of the Bestwood Company are in blast. The Staveley Company is now turning out a large quantity of pig, a good deal of which is used at the foundries on the spot. In manufactured iron a moderate trade is being done, but this branch has not made much progress of late years in Derbyshire. The steelworks continue as active as ever, there being plenty of orders for rails, of which more than 2000 tons are made weekly.

The Sheffield trades are in a healthy state all round, although some of them are rather less active than they have been. In the heavy departments there has been no falling off whatever, and the mills are kept fully going on the new armour-plates, with respect to which another patent has just been taken out by Mr. Wilson, of the Cyclops Works; both Cammell's and Brown's having large orders in hand for several Governments. Makers of ship-plates are also doing well, and the same is the case with respect to boiler plates; bars, sheets, and rods continue in steady request, so that the mills are working well in all directions. Of late there has been a considerable importation of hematite pig on account of Bessemer makers, who have now plenty to do in rails and railway material as well as in billets and special qualities for some description of cutlery and tools. Crucible still is in better request, and there is now more of it required for railway wheels, axles, picks, springs, and heavy goods. In the cutlery branches the men are well employed, especially in fine table, pocket, and other knives, some good orders having been received from America, Australia, and other of our own colonies.

During the last three or four years Sheffield has made marked progress in a new branch, that of light implements for agricultural and garden purposes. Messrs. Crowley and Co. have been most successful in turning out lawn mowers and other machines, and have distanced the old producers, having taken several of the best prizes given at exhibitions for certain specialties. At the foundries more is being done in heavy castings, as well as those of a lighter description. Cooking ranges and ornamental stoves have been more enquired for of late, and amongst those who have obtained a high position with respect to the two former may be mentioned Newton, Chambers, and Co., of Thornecliffe, whose London show-room contains an unique selection of those goods which for beauty of design, finish, and utility cannot be excelled.

The South Yorkshire coal trade is still dull, and the application made to the various railway companies for a reduction of the rate to London has not been complied with. The answer given has been simply to the effect that the matter is under the consideration of the boards of directors. The reduction of the rate is surrounded by many difficulties, and can only be done by agreement on the part of all the companies engaged in carrying coal to London.

CHECKWEIGHING AT COLLIERIES.—An important case was heard before Mr. W. F. Woodforde, at the Chesterfield County Court, on June 10. A collier, Wm. Handford, sued the Boythorpe Colliery Company for 61. 7s. 10d. wages. For the collier it was stated that the case divided itself into two parts, and was, in fact, a claim for work done by the plaintiff. The first part of the dispute was as to the coal got, which the defendants had taken as 22 cwt. to the ton; and the second had reference to coal, which it was contended, had been illegally condemned. According to the Mines Regulations Act of 1872, "all mineral gotten should be paid according to the weight, and should be truly weighed accordingly." This, it was submitted, meant that the coal had to be weighed according to imperial weights, and this was 20 cwt. to the ton. It appeared, moreover, that the manager had taken on himself the office of umpire between the bankman and the check-weighman. For the company it was contended that the men had power to make a bargain to get 22 cwt. to the ton, and be paid accordingly, which he held had been done in the present case. In regard to the coal condemned, the check-weighman did not attend the examination and the coal was condemned by the bankman. The manager of the colliery—Michael Straw—admitted in cross-examination, that he refused to allow the check-weighman to go down the pit; and also that he had been canvassing the men with the view of having another check-weighman appointed.—The Judge said the case was one of considerable importance. He had come to the conclusion that a contract had been made by the plaintiff to get 22 cwt. to the ton of coal, and, therefore, judgment on that point would be against the plaintiff. As to the other point raised he was of opinion that the company had no power to condemn the coal in the manner in which they had done, and judgment would accordingly be given in favour of the plaintiff. He believed that it was very necessary that a good feeling should exist between masters and men. He believed that feeling had not been exhibited in this instance on either side. He considered it monstrous for the colliery manager to go round with a man for the purpose of enticing the workmen to discharge their check-weighman. He hoped the attention of the colliery proprietors would be called to the conduct of their manager, and that such a thing would not be allowed to occur again. He gave judgment in plaintiff's favour for 19s. 7d., in addition to the 21. 16s. 10d. which had been paid into Court.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

June 15.—I admire the vigorous report of Capt. Ridge concerning the operations at the South Roman Gravel Mine, Salop, and I hope that the persons to whom it is addressed will supply him with the means of prosecuting the various works he enumerates, especially the shaft sinking on the course of the Roman lode. Death has been busy of late in removing from this district well known men who seemed not to have lived their full tale of years. At ages varying from 55 to 65 some men who could ill be spared have been taken away. Since I last wrote Mr. W. H. Darby, the active partner of the Brymbo Coal and Iron Works, has died rather suddenly, and it is felt that his death has been hastened by the anxieties caused by the late strike among the colliers. Mr. Darby was born at Coalbrookdale in the year 1818. He was the son of Mr. Richard Darby, of the

* See Mining Journal of Feb. 11. The delay having been caused by severe illness of the author.

† It is a well-known fact that in the tropics a clearing can be used only one year for plantation purposes. The fertility of the ground is such that it would yield good crops for several years; but it is just this very fertility which is the cause of the circumstance above indicated, for owing to it, after the effects of the first burning, by which the ground is semi-calcareous, have ceased to operate the wild plants shoot up again with great rapidity, and it would be futile under these circumstances to attempt planting again. In a few years, however, that capricious or jungle has grown so high that it could be cut down and burnt again so as to make the ground available for another planting.

well-known ironworks in that dale. With his brother, Mr. Charles Darby, he settled at Brymbo in the year 1845, and their partners were Mr. Roy and Mr. H. Robertson, now M.P. for Shrewsbury, who in those days were well known in connection with the North Wales Mineral Railway, which gradually grew into the Shrewsbury and Chester, and finally merging into the Great Western became part of the main line from London to Chester and Birkenhead. Mr. Darby was well known and esteemed in the district for the strength and consistency of his convictions, which were ever in sympathy with the progress and improvement of society. After an existence of eight weeks the strike of the colliers came formally to an end last Saturday by the acceptance of the 5 per cent. reduction in wages by the men of the Ruabon district. There has been much suffering among the families of the men, which has been lessened somewhat by the charity of the benevolent. It is a pity that the elder and more sensible men did not resort to ballot to test the feeling of the men generally before. It was resorted to at last, and resulted in favour of the resumption of work at the reduction.

TRADE OF THE TYNE AND WEAR.

June 14.—The steam coal trade on the north side of the Tyne continues good, and the works are generally well employed; this is expected to continue for some time to come. There has been no change in the value of the best large steam coal for some time, but the demand is good, and the prices of the last few months are well maintained. The value of the small coals, nuts, &c., are, however, gradually improving. One feature of the steam coal trade is the steady growth of the demand for small nuts and all kinds of manufacturing coal, both for home consumption and for export; many cargoes of this coal have been sent lately to the Baltic and other foreign districts, and there is still a good demand for export. Prices for this coal have improved considerably, and a further rise is probable. The sinking of the new shafts at the Dudley and Seaton Burn Collieries is going on steadily. At Killingworth no attempt has been made to re-open the old shaft, which was closed through the failure of the timbering a few months ago. A considerable quantity of good house coal, however, remains in the High Main seam, and there are also other valuable seams of coal unworked in the royalty, and it is probable that a new shaft will be commenced shortly for the purpose of opening out these seams. The gas coal trade in Durham continues fairly good for the season, and most of the gas and coking coal works are well employed. The house coal trade on the Tyne and Wear still continues flat, and there is much competition for orders both in the home and coastwise trade, and consequently prices have been run down to a considerable extent. The experiment made by the Marquis of Londonderry to supply consumers in London direct from the works has proved successful, and the quantity of house coal sent from Seaham for this purpose has been increased. As other colliery owners on these rivers are struggling with low prices it is a matter for surprise that they do not follow the example of the Marquis. It is, however, possible that particular reasons may exist to explain this circumstance to some extent. Some of the great coal factors and merchants in London are, we believe, connected with collieries in this district.

The pig-iron trade has been quiet throughout the week; the fight still goes on between the merchants and makers, and that appears to be the cause of the lull in the trade at present. Stocks have increased by 26,000 tons. The contest between the "bulls" and the "bears" must continue for some time longer, but if the makers persist and hold together, it is probable that they will ultimately triumph. There are, however, some makers outside the combination. Makers maintain their quotations of 43s. 6d. for No. 3 iron. The manufactured iron trade has been quiet; 71. 5s. still rules for ship-plates. Bars and angles are quoted at 6l. 5s. to 6l. 8s. 6d. The trade here has not as yet derived any benefit from the great strikes in America. There are still a few iron rails turned out at Darlington, but generally steel rails are cutting out iron altogether. The prospect for the finished iron trade is good, as iron shipbuilders are fully engaged until the end of the year, and some are so far a longer period, and this must keep the demand for all kinds of iron, castings, engines, &c., fair, if not brisk. On the west coast of Cumberland, although pig-iron is rather low in price, there is very great trading activity which centres especially around Workington. The commencement of a shipyard there, and the intended transference of the Dronfield Steelworks to that point, will give an immense stimulus to the trade of that district, which is already so good. The coal trade in Cumberland has improved considerably of late, and there is also expected a considerable addition to the fuel supplies of the district. A seam of coal 6 ft. in thickness has been proved on the estate of Mr. Mulcaster, and this important seam is expected to extend to the Royalty of Mr. Wooler, of Darlington, and it is probable that some arrangement will be made shortly to work this. For coke the iron trade of West Cumberland is largely dependent on the supplies from the Durham district; but for certain classes of steam and manufacturing coal a good supply is worked in the district, and the opening out of the seam referred to will increase the supply, and must contribute to the development of the steel manufacturing industries that are expected to be speedily transferred to West Cumberland. As the extensive and valuable deposits of hematite ore are only a few miles from Workington the situation is unrivalled for the manufacture of iron and steel of all kinds. Mr. William Penman, coal merchant, of Gateshead, has secured the patent for the manufacture of cast-steel chains without weld or joint. The chains can be made any length or size, and the strength of the links as compared with iron chains is double that of iron for any particular size. The invention appears to be a very valuable one. At Middlesbrough, on Tuesday, the news from Scotland respecting the state of the iron trade caused increased firmness, but only a moderate business was done, and there is nothing new to report respecting the trade. There was no change in the quotations for any description of iron.

THE HEAVY FAILURE IN THE COAL AND IRON TRADES.—The first meeting of the creditors of Messrs. Johnson and Reay, proprietors of the Castle Eden and Whitworth Collieries and of the Moor Ironworks, Stockton, was held at Middlesbrough on Tuesday. Mr. W. B. Peat, accountant, submitted a statement of the affairs of the firm, from which it appears that the total debts amount to nearly 170,000l., and the assets to less than 50,000l. The general creditors, who are unsecured, will therefore practically suffer a total loss. This state of matters is brought about, it appears to us, in this way—the works have been mortgaged from time to time to bankers to enable the owners of the works to carry on their business. This circumstance is unknown to the public or the trading community until the crash comes, so that the merchant or tradesman has no means of avoiding these pitfalls. Since the failure occurred loud complaints have been heard in this locality on this subject. One iron merchant and engineer has supplied goods lately to a large amount, and he has no means of getting payment for those goods. It is urged that mortgages should be registered or published in some way which would enable the public to have some idea of the position of the parties they are dealing with. As it is, a capitalist can heap in money to the full value of any concern, as he is secured, and does not incur any of the liabilities of the firm he is propping up.

NORTH OF ENGLAND INSTITUTE OF MINING AND MECHANICAL ENGINEERS.—A general meeting of members was held on Saturday in the Wood Memorial Hall, Newcastle. Mr. John Marley occupied the chair. A paper was read by Mr. E. F. Melley on the anthracite coal of South Wales, in which he stated that the total output, which was in 1855 907,000 tons, was reduced now to 674,365 tons, or about 5 per cent. of the total output of Great Britain, giving an average daily output of only 46 tons for the 52 collieries engaged in the trade. This diminution in the output was mostly to be accounted for from its having ceased to be used for iron smelting. The estimated quantity of this coal unwrought in Wales was about 3,200,000,000 tons. Mr. Melley wished to extend the use of this smokeless coal for house purposes by stating that its use in London was the only satisfactory means whereby the smoke nuisance could be reduced. Mr. Bunning (the secretary) gave a description of the Flues apparatus for enabling men to breathe in noxious gases, and Mr. S. H. Hedley, who used the apparatus on the occasion of the ex-

plosion at Seaham Colliery, in reply to questions gave much valuable information on the subject. The Secretary stated that the Steam Coal Trade Association had appointed a small committee to consider the advisability of keeping the apparatus at a central depot ready to be sent to any place when required on receipt of a telegram.

TRADE IN SOUTH WALES.

June 15.—The exports of coal from the South Wales ports for the month of May exhibit a high total. From Cardiff there were sent away 520,777 tons foreign, and 67,528 tons coastwise; Newport, 120,892 tons foreign, and 72,604 tons coastwise; Swansea, 86,771 tons foreign, and 77,032 tons coastwise; Llanelly, 9899 tons foreign, and 10,803 tons coastwise. The amount sent away last week was—Cardiff, 139,390 tons foreign and 19,363 tons coastwise; Newport, 29,340 tons foreign, and 17,848 tons coastwise; Swansea, 14,431 tons foreign, and 12,867 tons coastwise. Good colliery, double screened, may now be quoted at 11s., with a tendency to higher prices. The recent arrangement for the sliding scale has satisfied the steam coal colliers, but not the house coal. The amount of patent fuel sent away from Swansea in the month of May was 109,644 tons; Cardiff, 77,029 tons. Of coke Cardiff exported 14,669 tons; Swansea, 4793 tons; Newport, 3548 tons. The amount of iron exported from Newport in the month of May was 17,497 tons; Cardiff, 7131 tons; Swansea, 4277 tons. The quantity sent away from Cardiff for the week ending May 10 was 3155 tons, while Newport cleared 3378 tons. Iron ore is coming in increased quantities. Newport received last week 24,370 tons from Bilbao, and 4305 tons from other sources; Cardiff, 17,592 tons from Bilbao, and 2770 tons from other sources. The price may be quoted at 15s. 6d. per ton, with a tendency to weakness. The amount of tin-plates sent away from the whole country in May was 22,842 tons, of the value of 397,740l., against 18,539 tons, of the value of 315,980l. in the corresponding month of 1881. There are now 25 works wholly closed in South Wales, while the others are not working full time. The price per box at Liverpool is 16s., which is still unsatisfactory, and entails a loss.

Messrs. Henry Crawshaw and Co., of Shkemantle, in the Forest of Dean, have erected a ponderous pumping-engine at their works. The engine, which is of a novel construction, was designed by their engineer, Mr. P. Teague, and it varies from the usual Cornish pumping-engine by being actuated by steam above and below the piston, therefore is double the power of a single Cornish engine of the same cylinder capacity. The motion of this engine is regulated by a fly-wheel and crank, with a connecting rod attached near the pumping end of main beam; by this arrangement the surges of the pumps are taken up by the momentum of fly-wheel in a direct manner instead of passing through the centre of main beam, thus avoiding the risk of fracture in the fulcrum point. The pump-rods are suspended vertically from the outer end of parallel motion. The whole is perfectly balanced by a beam placed in an archway underneath the basement of the engine-house, which is a splendid specimen of skill and workmanship, reflecting great credit upon Mr. Thomas Smith, under whose personal supervision it was built. The pit is 600 ft. deep. There are three lifts of pumps, of which the following are some of the principal dimensions, &c.:—Plungers or poles, each 27 in. diameter by 12 ft. stroke, weighing, with the three pole-cases, over 40 tons; pump-rods are of hammered iron, 8 in. diameter at top lift, 7 in. in middle, and 6½ in. in bottom lifts, all joined together by cross-heads and side-slings, the power being applied in a direct line from top to bottom. The parts of pumpwork are unusually massive castings, the "H" pieces being 3 in. thickness of metal, and weighing about 15 tons each; clack pieces nearly 10 tons each, all other parts in proportion. It works 10 strokes per minute, the length of the stroke being 12 ft., and it discharges 2700 gallons of water per minute. The total weight of the castings and hammered iron rods, &c., for the pumpwork is upwards of 550 tons. The principal dimensions of the engine for working the above pumps are:—Steam-cylinder, 70 in. diameter by 13½ ft. long; piston-rod, 8 in. diameter; top and bottom nozzles fitted with double beat valves worked by two eccentrics, admission of steam controlled by a ball governor and throttle valve; condensing apparatus of the usual jet construction, condensing water being elevated to cistern from below by two house pumps, which are attached to balance beam, each is 17 in. diameter by 4 ft. stroke. Length of main beam to centres, 36 ft.; depth at centre, 6½ ft.; and weighs upwards of 30 tons. It is placed on a lever wall 6 ft. thick by 43 ft. high above the basement of the engine-house, and is secured by eight strong bolts. The fly-wheel is 20 ft. diameter, and weighs about 32 tons. The fly-shaft is of best forged iron, and has a cast-iron crank 5 ft. radius, weighing 3 tons. On the order being given to start by Messrs. Crawshaw's agent, Mr. Smith, the steam was admitted by the Neath Abbey Company's foreman, Mr. Joseph Rees (who had charge of the erection), and the engine moved with such celerity and regularity that anyone would think it had been at work for some time previous. Mr. Edwin Crawshaw was, unfortunately, unable to attend, but amongst a large number of persons present were—Mr. Henry Jones, managing partner of the Neath Abbey Iron Company; Mr. P. Teague, Mr. Jones, jun., and Mr. Roberts, Briton Ferry.

A correspondent of the South Wales Daily News writes—"During the week one of the most successful efforts in reference to winning coal has been achieved. At the Penrhinweiber Coal Navigation Company's pit the men started to raise coal at 7 o'clock in the morning, and continued as usual up to 6 o'clock in the evening, by which time they had succeeded in bringing to bank 1403 tons of coal, a quantity unprecedented in the annals of coal winning. To do this the engine and gear had to travel over 600 miles that day, and six carriages had to be raised from the bottom of the pit to the top, a depth of over 500 yards, every five minutes. As this extraordinary piece of work was accomplished without a hitch of any kind, the talk is that all concerned have something to be proud of.

COAL WINNING AT MAESTEG.—It is gratifying to note the success attending the sinking operations at Coegnant pit by the Llynvi and Tondra Coal and Iron Company. The pit is situated in the upper district of Maesteg on the Coegnant estate, the property of Mr. David Griffiths. Sinking operations were begun about November last, and already a depth of about 90 yards has been reached. While sinking the different strata some three little seams were struck, but this week the celebrated seam known as the Aberdare 4-ft. seam was struck, which caused no small demonstration of joy in the portion of Maesteg known as Llangynydd Higher. The company propose continuing the sinking to about 200 yards, when they hope to reach the lower seams. Although the Llynvi Valley is amongst the first valleys where coal was discovered in South Wales, it is a notable fact that all the companies who have worked in the valley, excepting the proprietors of Oakwood Colliery, no company has yet worked the lower seams. Should the success that has hitherto attended the sinking of Coegnant pit continue until the lower seams are reached, it is certain that a higher future than ever is soon awaiting the people of the upper district. The drawback in the collieries of the Llynvi valley is the many faults and disturbances the coal measures give evidence of. As this pit is on the north side of the anticlinal crossing the valley the beds of coal are found in a more regular form. It is expected that the lower 6-ft. seam will be struck in about four weeks. The coal of the 4-ft. seam is of excellent quality, and has been inspected by many of the old colliers in the district. Mr. W. Blakemore, F.G.S., the general manager, watches with interest the progress made at the pit, and feels sanguine as to the ultimate success of the operations. Specimens of the different strata pierced are kept in the office, and organic fossiliferous remains are carefully preserved. Mr. D. S. Rees is the certificated colliery manager at Coegnant Pit, and he is to be congratulated on the success that has attended his efforts here.—*South Wales Daily News.*

SMOKE ABATEMENT EXHIBITION.—The following is the list of awards at this exhibition:—Open grates for bituminous coal: Brown and Green, underfed grate, gold medal; Clark, Bunnett, and Co., Ingram's grate, with Wallend and anthracite; and E. H. Shorland, Manchester ventilating grate, silver medals. E. R. Holland, underfed grate, H. E. Hoole, radiating and reflecting grate, Feetham and Co., basket dog grate, J. M. Stanley, hopper bottom fed grate, T. E. Parker, and Reeves and Henry, respirator grate, bronze medals. Doulton and Co., tile grate, Rosser and Russell, and G. Haller and Co., Koblhopfer hot-air stove, honourable mention.—Open grates for smokeless coal: Coalbrookdale Company, Kyrie grate, and Yates, Haywood, and Co., back and side draught ventilating grate, silver medals; M. Perret, bronze medal.—Close stoves for bituminous coal: C. B. Gregory, J. Cornforth, "Little Wonder," and R. W. Cro-

thwaite (with Gregory improvement), silver medals; J. F. Farwig and Co., and J. Dunnachie, bronze medals; Rev. H. J. Newcombe, honourable mention.—Close stoves for smokeless fuel: W. Barton, F. Lönholdt, Musgrave and Co., slow combustion, H. J. Piron, and H. Hunt, Crown jewel, bronze medals.—Kitchens: T. J. Constantine ("Treasure" range), Eagle Range Company, Radiator Range Company, Brown and Green, and Falkirk Iron Company (Dr. Siemens's principle), silver medals; Newton, Chambers, and Co. (Thorncliffe range), W. Stobbs (anthracite range), and M. Feetham and Co., bronze medals.

THE CONVERSION OF STAFFORDSHIRE IRON INTO STEEL AND INGOT IRON.

A number of experiments of converting Staffordshire pig-iron into steel under the Thomas-Gilchrist process were carried out on Friday, at the Patent Shaft and Axletree Company's Works, Wednesbury. The trials, which took at the Monway Steelworks of the company, were witnessed by the leading members of the South Staffordshire and East Worcestershire iron trade. In addition to the inventors, Messrs. S. G. Thomas and P. C. Gilchrist, of Middlesbrough, who conducted the experiments, there were present Messrs. Alfred Hickman, Wolverhampton; Richard Williams, managing director of the Patent Shaft Company; B. Hingley (Chairman of the Ironmasters' Association), and G. B. Hingley, Netherton; Alfred Baldwin, Wilden; W. Farnworth (Messrs. Balwin's general manager), P. D. Bennett (Horsley Iron Company), Thomas Barker (Chillington Iron Company), Wolverhampton; A. W. and E. Hickman, Wolverhampton; R. Heathfield and T. Butler (Messrs. Heathfield and Co.), Smethwick; Zachary Lloyd, Stourport; C. Crowther, Kidderminster; and F. Plum (Messrs. Crowther and Co.), Hutton (John Russell and Co.), Walsall; J. W. Wailles, general manager of the Patent Shaft Works; and S. Smith, manager of the company's Bessemer department. The experiments were made with about 3½ to 4 tons of Mr. Alfred Hickman's cinder pig. The material was first smelted in an air furnace, and then run into the Bessemer converter, which as lined with magnesian lime prepared in a peculiar way. Before running the molten pig into the converter about 15 cwt. of ordinary lime had been previously put into the converter. Then the iron is blown for 20 minutes, and a sample taken out. If this proves satisfactory the contents of the converter is again blown for three or four minutes to eliminate the phosphorus. The hot metal is then poured out into a large ladle, and from this it is emptied into a number of ingot moulds, which hold from 12 to 15 cwt. of metal each. This process over, and the ingot shells having been removed, the ingots are next taken to the reheating furnaces in the mill. From here the material is taken to the rolls, and made into various descriptions, such as bars, boiler-plates, sheets, tin-plates, and strips.

After a quantity of bar-steel had been rolled down it was cut up, and the pieces tested under a heavy steam-hammer. The doubling-up test was accomplished in every instance without a sign of fracture, the material being quite homogeneous, and showing no lamination or marks on the sides; in fact, the sides of the bar came up as clean as silver. Further tests were applied in the blacksmiths' shops by the heating of square bars, and holes punched through them within one-eighth of the side without showing any indication of fracture. All the trials were pronounced by the practical gentlemen present as being not only very interesting to the trade, but of the most successful and satisfactory with steel they ever witnessed. With regard to the cost of converting the pig iron into this soft kind of steel, it is calculated that there is a great waste in the working up of pig into puddled bars, and a further waste in the rolling down of the materials into bars. There is very little waste in the conversion of pig into ingots, while the production of bars and other finished steel from the ingots results in a waste of only one-third of that of puddled bars. To produce a ton of finished bars requires 23 cwt. of puddled bars, while a ton of soft steel bars can be made with 21 cwt. of ingots. Then, as to the cost, it is calculated that if the pig-iron costs 40s. per ton, by the time it is converted into ingots the value has reached 68s., and when rolled into finished bars the utmost cost is not more than 93s. to 95s., while the soft steel will much better serve purchaser's requirements than iron. The same process of conversion is being carried out in different other countries. The patentees have on hand at the present time engagements with German, Austrian, and Belgian ironmasters, and it is estimated that soft steel is being produced in the different iron centres of Europe at the rate of 500,000 tons per annum.

At the conclusion of the trials at the Patent Shaft Works, Mr. B. HINGLEY remarked that they could not separate without expressing their opinion, as practical men, upon what they had seen that day. There was no doubt that the conversion of pig-iron into steel would in time supersede puddling. The product they had seen that day sprang from the same source as finished iron; it was only the different treatment. The steel made that day was much superior to iron, and would answer all the purposes for which it was required, while the conversion process would be the means of saving a considerable amount of labour. They were very much indebted to the Patent Shaft Company for their courtesy in allowing the experiments, and also to Messrs. Thomas and Gilchrist for the successful way they had carried out the trials. He was sure the company would join with him in expressing their thanks to the Patent Shaft Company, and also to the patentees, for what they had witnessed. (Hear, hear.)—Mr. ALFRED HICKMAN wished to endorse all that Mr. Hingley had said. The Patent Shaft Company had placed their plant, &c., at the services of Messrs. Thomas and Gilchrist and himself, and the district was very much indebted to them. What little part he (Mr. Hickman) had taken in the matter was for the benefit of the members of the trade, and he should be pleased at all times to do what he could to raise the character of the district, as he did not wish it to be behind other districts.

Mr. WALES thanked Messrs. Hingley and Hickman for their remarks regarding the Patent Shaft and Axletree Company. He had been very pleased to meet the company he saw around him. Their thanks were due very much to the public spirit of Mr. Hickman, who had shown a wonderful amount of zeal in the experiments. They could not but regard the trial as likely to have a very important effect upon the future destiny of the iron trade of this district. The iron manufacturers in this district had to compete throughout the whole world with many other manufacturers who could put the finished article on board at a much less cost than they could, and, therefore, it became the duty of the manufacturers in this district to do what they could to raise its status in regard to the material wanted. The Thomas-Gilchrist process would very much cheapen the price of the finished article, and so place the manufacturers of this district in a position that they would be able to successfully compete with any other iron or steel producing district. He again thanked Mr. Hickman and the patentees for the admirable way in which they had carried out the experiments.

Mr. S. G. THOMAS (one of the patentees) expressed his thanks to the Patent Shaft Company and to Mr. Wales for the courtesy and assistance that had been afforded himself and his colleague. Their thanks were also due to Mr. Hickman for the great zeal he had shown in the matter. It was very important in any new experiments that they should be associated with gentlemen of unimpeachable character and integrity, and who were known for their perfect impartiality. Mr. Hickman had all those characteristics, and he had rendered a very great service to this district. He thought it would be seen, now that steel could be made from Staffordshire cinder-pig, that there was a great future in store for the trade of this district, and he hoped that in a few years time the position of the iron and steel trade of South Staffordshire would be much more satisfactory than it had been latterly. (Hear, hear.)

Mr. ZACHARY LLOYD said when he first introduced the Bessemer process into this district he had no idea that it would be so successful for steel-making as had been demonstrated that day. He believed there was a great future before this district, and that the prospects of South Staffordshire were brighter than he had ever known them. They were much indebted to Mr. Hickman and the patentees for the success of the day's trials.—Mr. P. C. GILCHRIST after expressing his thanks for the compliments paid to himself and his colleagues, said when the trials were further developed, he pro-

posed to send samples of the steel to the makers of tin-plater, cables, and other descriptions of finished articles to see how the material answered their requirements. The pig-iron had worked very well, although there was 3 per cent. of phosphorus in it, twice as much as there was in Middlesbrough iron.—Mr. PLUM and one or two other gentlemen also made a few congratulatory remarks on the success of the experiments, after which the company dispersed.

The patentees, in further explanation of their process, state:—As compared with puddling, we find that the basic Bessemer process is more economical in every item except that of loss of metal, the economy in labour and fuel being especially notable. Reliable returns show that for puddled iron the cost of the labour by the time the finished bar is made is 13s. 6d. per ton, against 3s. 6d. for soft steel. Fuel for puddled iron costs 6s., and only 1s. 3d. for steel, while the sum of 4s. 2d. for fettling the furnace is dispensed with in the new process. The waste is one-third less in soft steel than that of puddled iron. How rapidly steel is growing in favour, notwithstanding its present relatively high prices, is shown by the fact that on Jan. 1 last there were steel ships building under Lloyd's survey alone to the extent of 142,000 tons, as against nil in 1876. In considering the peculiarities of ingot iron as compared with puddled iron, it is shown that the loss due to oxidation and expulsion of cinder in reheating and rolling a pile of puddled bar to finished product, is far greater than that attending the same process on an ingot, while the labour cost is also much higher. The average oxidation waste from puddled bar to finished bar or iron rails is more than 3 cwt. per ton. The oxidation waste from ingot to steel would be less than 1 cwt. This saving of 2 cwt. per ton in oxidation waste alone represents a money saving on using ingot iron of from 7s. to 8s. per ton. With reference to the superior strain of steel, the patentees say that numerous recent cases in which steel-built ships have come out of violent collisions, and running on rocks with nothing worse than dents, show this in a very striking way. There is a very general impression that the cost of Bessemer plant is greater than that of a puddling forge; but, so far from this being the case, the first cost per unit of product is unquestionably less for the Bessemer plant.

SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE INSTITUTE OF MINING ENGINEERS.

The monthly meeting of members was held on Monday, at the Mining Museum, Dudley.—Mr. WM. FARNWORTH, President, in the chair, and there were present, among others, Messrs. H. Johnson, jun. (Vice-President), H. Johnson, sen., T. Parton, J. Hughes, W. J. Davies, W. North, D. Rogers, J. F. Addenbrooke, W. J. Hayward, C. H. Treglown, A. Sopwith, J. M. Fellows, R. Latham, and Alexander Smith, secretary. The minutes of the previous general meeting and of Council meeting were read and confirmed.

Mr. ALEXANDER SMITH, M.Inst.C.E., read a communication from the trustees of Mason's College, Birmingham, saying they extremely regret that they are not at present in a position to make arrangements to accommodate the members of the Institute in the college.

The PRESIDENT read a short paper upon the

LIME PROCESS OF GETTING COAL.

Mr. FARNWORTH had a diagram showing the process at work at the Shipley Collieries, Derbyshire. The charge, which is a cartridge containing lime in a special caustic state, made of mountain limestone, ground to a fine powder and consolidated by a pressure of about 40 tons, the cartridge is about 2½ in. in diameter, and has a groove along the side. The shot hole is drilled, a perforated iron tube, having a groove on the upper side, is inserted the whole length, being first enclosed in a calico bag, and having a tap at the end of the pipe. The cartridge is inserted and tightly rammed to ensure it fitting the bore-hole. A small force pump is then connected with the pipe at the tap by a flexible tube, and water equal in bulk to the quantity of the lime is forced into the bore-hole. The water commences to operate, the air is driven out by the current of the water, the tap is closed to prevent the escape of steam generated by the action of lime, and the flexible tube disconnected. The sprays are left in to allow the coal to exert itself as far back as possible. In from 10 to 15 minutes, on removal of sprays, the coal falls clean from the roof in large masses ready for loading, practically making no small, and removing all danger of igniting gas.

Mr. HENRY JOHNSON, jun., followed with a few critical notes, resulting in a prolonged discussion. It was eventually agreed to ask the patentee of the lime process to experiment in the district before the members, and that the trials be made at Cannock Chase Colliery as soon as arrangements can be made.

Unanimous votes of thanks were passed to Mr. Farnworth and Mr. Johnson, and also to the Council of the North of England Institute of Mining Engineers for the presentation of Transactions and publications to the Institute for the Reference Library.

MINING ENTERPRISE ON THE GOLD COAST.

From the study of Capt. Burton's paper read before the Society of Arts, and of which an abstract was given in last week's *Mining Journal*, most persons will be disposed to admit that he well supported his position that the Gold Coast is a neglected El Dorado, but the discussion which followed could leave no doubt that two very great difficulties have to be overcome—those of labour and the climate. These were made light of by those interested in securing the commercial development of the region, but they are nevertheless of vital importance to those who are thinking of risking their capital. The observations of several of the speakers also infer the existence of other obstacles to success which are not openly mentioned. In the course of the discussion Mr. Johns said that he was engaged in these gold mining operations, and he felt very strongly that the labour question was of great importance. His idea was, that they should get all the companies engaged in the enterprise, to adopt some general system of importing Chinese labour, which had been found so valuable in California. It was evident that something of this kind must soon be set on foot, if the enterprise were to be as successful as it ought to be. The various tribes on the coast from which their supply of labour was drawn, understood each other very well, and unless something were done, they would soon find the price of labour rise against them. There were several companies now engaged, but he feared if they all acted on purely selfish motives, they would entirely break down; they wanted a spirit of union amongst them, in order, not only to import Chinese labour, but also to fix the price of European labour, to protect themselves in case of alarm and other matters. Now the question which naturally suggests itself is what are the alarms and other matters against which protection is needed, and are they such as will prevent capitalists who risk their money from obtaining a return for their enterprise?

The deadly character of the climate would be quite as easily proved as its extreme salubrity; Mr. Walker, with two bottles of whisky a week, finds it about as healthful as Maderia, whilst Mr. Thomas Cornish, an old Australian miner, who has borne considerable knocking about in various parts of the world, either from inability to drink sufficient whisky or from want of appreciation of African fevers, was unable through illness to get so far as Apollonia, and had to bring his visit to a rather sudden termination to prevent damaging the reputation of the Gold Coast as a health-resort by assisting to increase its death rate. Mr. Cornish admitted that he was exceedingly well pleased with the prospect he saw at the Gold Coast. He had samples which were washed out in his presence, showing the extreme richness of the titaniferous sand along the coast. Going up the Anobra, too, there were many excellent "prospects," though they had not time to examine them carefully; he felt sure there were many places there which would pay well, both for sluicing and dredging. He could bear testimony to the good prospects for gold mining on the West Coast generally. The great difficulty, no doubt, would be the labour question; the West Coast being so different from Australia and California, where a white man could work hard from morning to night, and where food was plentiful. In Africa it was necessary to employ black labour; the Kroomen were very good workers, and soon learned how to use a pick and a drill, but when you were working with two or three of them in a level, at any depth, artificial ventilation would be very necessary. The wages were about 1s. 3d. or 1s. 6d. a day, and if the companies were to fix some such rate it would be very fair, and the men could earn good wages at it. The question of white men's health would also have to be studied, and one very necessary thing would be to avoid over-indulgence in stimulants, for that was one of the greatest curses on the coast.

The healthfulness of a district cannot be judged of by considering whether one man has been able to live there. It would be interesting to know what was the average number of months during which the carpenters and others employed by him lived at the Gold Coast, and what percentage of them left the country alive. Mr. Oliver Pegler, being a promoter's reporter par excellence, declared that even Capt. Burton's statement on the question of the richness of the gold in the lagoon was exceedingly moderate. Mr. Pegler, however, seems to have made the merest flying visit to the region. He does not say how many days he was in the region; but he appears to have done 1000 miles as fast as a steamer could make the journey, and to have landed wherever it touched. The sands of every river contains gold, there were evidences of gold along the entire 1000 miles, and the geological formation was, in his opinion, eminently typical of gold, particularly the alluvial strata, and these alluvial deposits were so gigantic that the puny efforts of the natives in the past had made no appreciable impression upon them. With regard to the labour question he said that no doubt the Kroomen were a splendid set of men, but when operations became much enlarged, he feared this source of labour would become very limited. He had seen gold mining in Venezuela carried on very successfully with Indian coolies; but, in his opinion, it would be better to have Chinese, as they possessed more strength, and were better able to shift for themselves. In Africa, however, there need be no lack of food. There was abundance of vegetable produce. A great many people threw cold water on this enterprise on account of the climate, but when greater provision was made for comfort sickness would decrease. If anyone had travelled in Britain 2000 years ago, when it was covered with forests, and had been taken ill, he would probably have sickened and died. The West Coast of India was, at one time, as unhealthy as the West Coast of Africa, but Bombay was now one of the finest cities in the world. Demerara, again, was one of the healthiest cities, barring yellow fever. In all these tropical countries fever was the great evil; but he would rather live in Africa with its chances of fever, than in England with its east winds. If the companies would treat their workmen properly they might live there well.

A somewhat less encouraging view was expressed by Mr. Liggins, who remarked that he had on his finger a ring, which he had had for 25 years, made from gold found at Cape Coast Castle, so that he had no doubt about gold being there, but that was no proof that it would pay to get it. Ballarat had sent nearly 300 millions of gold to this country, but it scarcely paid to get gold there now. He knew Demerara very well, but no one who lived there considered it a healthy place. He was always very well there, but he could hardly reckon the number of his friends who had died there. He believed it would be utterly useless to send English workmen to superintend these gold mines. He had had experience of coolie labour in the West Indies, and of Chinese, and, in his opinion, the only way in which there was any chance of working these mines at a profit was by means of Chinese labour. Dr. Hewan did not agree with Mr. Walker's whisky theory, but thought there was no doubt that indulgence in spirituous liquors was the great cause of mortality on the West Coast. Mr. Christian Mast understood that behind the Gold Coast lay the kingdom of Ashantee with a population of from 4,000,000 to 6,000,000, and that the kings and kinglets of the interior were very desirous of having an outlet to the coast which had caused the previous war, and might lead to further troubles. Mr. Hyde Clarke said they might derive one comfort from Mr. Liggins's remarks, and that was that he did believe in Chinese labour. He was astonished that a man of his experience should say it was impossible to employ European labour in the district, because any one of them who had been concerned in such operations knew that they could get men from this country to work in any part of the world under much worse conditions than those offered by a mining company in West Africa. British miners would go to any part of the world where they were offered fair treatment and good wages; many of them were saving men, and therefore sober men, and there was no doubt that a fair supply of them to superintend and instruct the native labourers could be obtained. They had heard that the average price of labour was 1s. a day, or whatever it might be, and you might fancy that you could get the labour you wanted at that rate; but the moment you began employing a considerable number of men, you used up all the surplus labour and raised the price against yourself. The only practical mode of meeting the difficulty was by importing labour, as had been recommended, so as to swamp the results of competition among the local labourers. But there was sometimes a practical difficulty which ought to be mentioned. The employer had to pay the passage of the labourer, and then, if he did not take care, the labourer might run away and get employment with one of his competitors. It would be very necessary, therefore, that some means of enforcing labour contracts should be provided; this was a point worthy the attention of the authorities on the West Coast, and when it was done labour might be safely imported. The question of cheap labour was very thoroughly treated by Sir Thomas Brassey in his book entitled, *Work and Wages*, which was founded on his father's experience, and he there stated that whenever his father carried out any large operations abroad he never calculated on the low price of labour in the country, but always on the English rate, and that he found could be safely taken as the standard. This might at first sight appear to be a paradox, but it was very fully explained and justified in the work he had mentioned.

It was stated by Capt. Cameron that a British Commissioner and a force of British constabulary were established as far as any of the mines, and the limits of the Protectorate were well known as to the boundaries of the various tribes, though they were not yet accurately defined geographically. It was not necessary for him to say anything about Capt. Burton's paper, for they had worked hand-in-hand the whole time. They were both of opinion that immigration of labour was necessary for the whole West Coast, and that it would be provided best from China. At Lagos, a Frenchman told him he should be glad of 600 coolies for his commercial operations. He quite endorsed Mr. Cornish's remarks; he did a little dredging on the Anobra, and the results looked very promising, though they had not been tested. He hoped the "flats" would be lifted by machinery, and worked down by sluices and "long toms." Ventilation he had seen managed very successfully by means of fans worked by hand labour, but immediately two galleries were put in communication with each other, so that there was an up and down current established, these difficulties would cease. Science was always progressing, and as people went more to new climates they would adopt better means for ensuring their health. They might lose some men, but what struggle was there in which some lives were not lost for the benefit of humanity? The Ashantee scare simply showed the hollowness of the present Ashantee empire. He did not calculate labour at the English rate, but rather higher; he knew it cost 120l. to build at Bombay, though labour was cheap, what you could build for 40l. in an English dockyard. You ought to calculate not by the rate per day, but by the amount of work done for a given sum of money.

After a few observations from Messrs. Dipnall, Swanzy, and Andrew, the Chairman (Sir Rutherford Alcock, K.C.B.) remarked that every one admitted that there was a large extent of alluvial country full of gold deposit which might be extracted, and the only two factors which had to be considered were whether the climate and the supply of labour would enable Europeans to extract it at a profit, and without leaving their bones in the midst. The great fault of Europeans, which had cost many thousands of lives, was that they continued the same diet which suited them in a cold climate, where they could take plenty of exercise in the tropics. They would do much better to follow the example of the natives. They heard a great deal of what the Chinese could do; but their diet was almost exclusively rice and weak tea, with a little mild tobacco; and he was sure that if Europeans did the same they would not be much the better for it. It astonished him very much that Africa, which had been for so many years the great storehouse of labour for the rest of the world, for Europe and America more especially, with its continuous demand for slave labour, was not able to supply the labour for its own occasions. It seemed very hard to send to China for labourers to come and take away African gold, when there were so many millions of strong vigorous negroes there. If they were fairly paid and well treated he did not believe there would be any necessity for going to China for help; though he had no doubt any amount of

labour could be obtained from thence. Even at the present day the slave trade was still carried on in Africa, and, however hardy the Chinese might be, he could not believe that people born in the country would not stand the climate better than strangers. By utilising native labour in a legitimate way more would be done to root out slavery than all the fine speeches and philanthropic efforts in other directions could ever accomplish.

GEOLOGY OF COSTA RICA.

A professional visit to Costa Rica in connection with the extension of British mining enterprise to that country has recently been made by Mr. George Attwood, F.G.S., A.M.I.C.E., and at the last meeting of the Geological Society he gave an interesting account of the geology of Costa Rica, which was accompanied by an appendix by Mr. W. H. Hudleston, M.A., F.G.S. It appears that Mr. Attwood commenced his journey at the town of Punta Arenas, on the bay called Nicoya Gulf. This stands on a peninsula composed of a calcareous sandstone covered with a dark sand, consisting of quartz-grains, magnetite, and decomposed felspar, and augite. Inland is an igneous rock which occupies before long both banks of the Rio Barranca, and on the left bank extends to the sea. It is a greenstone containing porphyritic crystals of augite and trichloric felspar, and appears to contain too much silica for a true dolomite, being rather a representative of one of the more basic forms of the augite-andesites, resembling in some respects specimens from the English lake districts described by the late Mr. Clifton Ward. On this rock, after a time, are found boulders of a black augite-andesite; this appears to be identical with the rock found *in situ* in the Aguacate Mountains. Here are gold and silver mines, which were described. In the ravine of the Rio Grande lignites are found. Below this is a series of ancient lakes, which on the Pacific slopes have been tapped by the Rio Grande, on the Atlantic of the Rio Reventazon. Here also the country rock is the greenstone already described, and near Cartago there are boulders of trachyte. The volcano of Irazu is a trachyte, probably a quartz trachyte, forming an important building stone. Augite-andesites are found at La Palma, about 12 miles north-west of the volcano. Irazu, a volcano at present passive, but with blow-holes of gas, is between 11,000 and 12,000 ft. in height. Turrialba, of about the same elevation, is still feebly active. Mr. Attwood is of opinion that the filling of the mineral lodes (ancient fissures) in the Aguacate Mountains took place in Tertiary times, probably Pliocene, and that this infiltration was contemporaneous with the eruption of the augite-andesites in the same region. The quartz trachytes and sandstone are certainly Post-Tertiary.

The paper was illustrated by a good collection of specimens of rocks and microscopic sections, and in the course of the discussion which followed the reading of it Mr. Hilary Baerman expressed his sense of the value of the section made in a little-known country. It was an interesting question, looking at the comparatively modern date of the igneous rock described and the absence of schistose rock, whether the seas had previously communicated. As for the condition of the transformed masses of rock containing minerals, he was glad to find Mr. Attwood had observed it, for he had noticed the same thing in Spain and North America, and thought that it had been too often overlooked in the search for lodes. Professor Warrington Smyth, M.A., F.R.S., asked upon what ground Mr. Attwood stated that there were no more ancient rocks than those which he had seen? Had not vegetation possibly masked them, and might not there be granite rocks to furnish the kaolin? Was the coal merely carbonised stems or a true lignite? Was the entire run of the veins metalliferous? Mr. Attwood said that he had not himself seen any case of metalliferous rock like those which he had described. Very likely the oceans had once communicated. He saw no signs of granite in the country. As for the vein-matter in the lodes, he thought that the eruptive rock and the fissures in which these lodes occurred were of about the same age. The coal was only limited in area, but varied from partly carbonised matter to true lignite. The sandstones, like the coal, were only found in the ravines near the volcanoes, and were of small area.

COLORADO MINING AND INDUSTRIAL EXHIBITION.

Although frequent reference has been made in the *Mining Journal* to the Leadville, the Rico, and other attractive mining districts in Colorado, and although the La Plata Company keeps the State ever fresh in the mind of capitalists by its regular monthly dividends of 12 per cent. per annum, it is not doubted that the National Mining and Industrial Exposition, whose first annual display will take place at Denver from Aug. 1 to Sept. 30, will not only give existing companies information which will enable them to extend their business and make it more remunerative, but will prove that there are many unwrought localities upon which British capital could be profitably expended. The corner stone of the building in which the Exhibition is to be held was laid with much ceremony and rejoicing on May 2, and from the programme of the arrangements to be adopted, and account of the proceedings, which have been forwarded by Mr. Francis A. Sands, there are good reasons to anticipate that the gathering will be a success. The classification alone suffices to show how much the people of Colorado have to exhibit, whilst the fact that the places of honour to mineralogy, geology, and metallurgy indicates that the importance of the mining and allied industries is fully recognised.

The Mineralogical Department is divided into 11 classes, embracing respectively gold, silver, iron, lead, and copper ores, fire, potter's, and other clays, bituminous, anthracite, and canal coals, lignite, and other metalliferous specimens not enumerated in the other classes. In the Geological Department there are eight classes—marbles, lithographic stone, limestone, miscellaneous building stone, fossils, gypsum, precious stones, and crystals, and native chemicals. Then follows the Hardware and Edge Tools Department, and next comes the Metallurgical Machinery Department with its four classes—the first embracing reverberatory roasting furnaces, blast and reverberatory smelting furnaces, and cupel, retort, and other furnaces for separating base and precious metals. The second class includes stamp mills for free gold ores, for free silver ores, and for dry crushing, and furnaces for roasting refractory gold or silver ores. In the third class come pans and settlers for amalgamation, vats for leaching process, and concentrators for crude ore or tailings, whilst there is a fourth class for devices which do not come within either of the three classes mentioned. The next department is devoted to agricultural and horticultural products and floral displays and general machinery, including steam-engines and machine tools, come in the following department. The remaining six departments include agricultural and horticultural implements and vehicles; textile fabrics and leather; household goods, jewellery, scientific instruments, and ceramics; objects connected with the liberal arts, natural science, and education; food preparations and miners' supplies; and chemical and medicinal preparations; whilst a 13th department is reserved for miscellaneous unclassified articles.

It is truly remarked that in natural resources the Rocky Mountains contain a varied and practically inexhaustible supply. The number is only limited by the incomplete examinations which have been made from time to time. Each year brings to light new deposits not only of precious metals, but of other mineral substances of great commercial value. There is, it is added, no portion of the world that possesses equal advantages or surer highways to fortune than these mountain States, and many of these paths are to-day awaiting their particular pioneers. The National Mining and Industrial Exposition will encourage exploration and development, and the proceedings on the occasion of laying the corner stone are a good earnest of the energy and feeling that will be shown by those concerned. The State, County, and City officials, and a large number of prominent citizens were present, and in an able address Governor Pitkin remarked—"This is the first National Mining Exposition which has ever been projected in this country of which I have any knowledge. No one can fail to see the propriety of its being inaugurated at the capital City of Colorado. We are to-day the great mineral State of the Union. From small beginnings we have grown year by year until we have outstripped the older States on the Pacific coast. In 1878 the product of our mines was about \$8,000,000. Last year it

amounted to nearly \$25,000,000. The time is not far distant when our shipments of bullion and ore will reach \$50,000,000 annually, and it is such enterprises as we are inaugurating here to-day that will contribute largely to this result. There is a greater necessity for a Mining Exposition in this country than for one of any other character. The number of persons who are interested in mines or who believe themselves to be by virtue of the ownership of a few shares of mining stock, is nearly equal to the farmers of the country. They are scattered all over this broad land. Most of them are entirely ignorant of everything pertaining to mining, except what they have learned from the prospectus of some bogus company, or from the pictures on their certificates of stock. One of these engravings so common on these mining shares represents two miners at work on a tunnel whose entire length is about 3 feet. This is a most appropriate picture, for the tunnels represented by these companies are rarely greater than 3 ft. in length. It is the sale of worthless stock of this nature, peddled in small quantities in the different cities and villages of the East, that has brought our mines into disrepute. We want the people of the East to come here and see in this building the product of our mines. We want them to go into the mountains and see the great mineral treasures in the mines themselves. Such observation would more than counterbalance the injury done by the sale of fraudulent stock. We hope this Exposition may do much towards making mining here a legitimate business, conducted on ordinary business principles. Poor mines should be abandoned and the thousands of good ones developed. When this is done mining investments will be the most profitable in the world."

SOUTH AUSTRALIA.

From recent Indian papers we gather that Major Fergusson's mission to that country to arrange for coolie emigration to the Northern Territory gave rise to a discussion that lasted long after he returned to this colony. Judging from a series of articles in the Pioneer, one of the most influential of Indian journals, Major Fergusson appears to have made a very good impression by the way in which he discharged his duties and the success that attended his negotiations. He evidently availed himself of the opportunities presented for circulating information regarding the Northern Territory, for this is how that portion of the colony is described by the Pioneer, and its fitness pointed out as a residence for the coolies:—"The Northern Territory, as the name is now understood, contains 500,000 miles, or 320,000,000 acres, lying between the 11th and 26th parallels of south latitude, or almost entirely within the tropics—a zone corresponding to that which in the northern hemisphere includes British India between the parallels of Pondicherry and Patna, and the eastern peninsula from Tenasserim to the latitude of Cachar. The climate is, therefore, tropical, and should suit natives of India. There is a wet season of four months, from December to March, during the north-west monsoon, but a good deal of rain falls also in October and November, and April also is showery. During the height of the rains the weather is hot and steamy; but as the maximum temperature during the day is only 96°, and the minimum during the night reaches 65°, the climate appears to be mild as compared with most parts of India. Probably it might be compared with that of the Dehra Dun in India during the hot weather and rains." The geographical position of the territory is also described in another article in a most appreciative fashion, while the advantages that it might be made to confer on India, as a horse and mule depot are not lost sight of. As Port Darwin is eight days nearer England than Melbourne, the export of frozen meat ought in time to become a great item of trade. And as horses thrive exceedingly well, and the voyage to India is short and smooth as compared with that from Melbourne, they would, if exported to India, arrive there from a similar climate already acclimatised and in better condition, and with far less loss than from the southern ports. On this account it has been suggested that the Government of India might do worse than take up a large tract of land in the Northern Territory and breed horses and mules there for the Indian army. It is of course chiefly for agricultural operations that immigrants are wanted from India. In the cultivation of sugar, cotton, indigo, tobacco, arrowroot, rice, and perhaps coffee, the coolies will be in his element, and facilities will, no doubt, be granted for the growth also of the vegetables, pulse, and curry ingredients which he may require, and for the production of which the climate seems eminently suitable. Besides this, the short and smooth passage from Calcutta or Madras, as compared with that to most other fields of emigration for India, the Northern Territory seems to offer peculiar facilities for the import of labour. And very shortly there will be a demand for labour with which to make a railway into the interior, the length and ramifications of which will extend as settlement progresses. A report on this projected line has already been made to the Government, and it is intended that the line from Port Darwin southwards shall ultimately connect with the proposed transcontinental railway. In fact, the full development of this as other new countries may almost be said to depend upon the construction of a railway, and the Colonial Government are looking to Indian labour to enable them to undertake it, for were they limited to European labour the difficulty would be immense.

Gold mining seems to be making a fresh start judging by the favourable reports received from the mines, and the rich specimens which are exhibited. We have lately seen four very good samples, two of auriferous quartz, and two of gold, which, though coming under the denomination of alluvial, had evidently not travelled far from a reef. The first sample of quartz was from a reef about 3 miles from Blumberg, which is being worked by private company under the management of Mr. Wilson. The quartz appears to be of a favourable nature, is mixed with ironstone, and shows gold pretty freely and plenty of auriferous mudstone. The other sample was from the Old Kangaroo Mine, and is of very superior quality. It shows gold freely, and is mixed with a brown stone carrying good gold and called porphyry by the miners. We are informed that the reef is looking very promising, and the stone generally is rich in gold. We have also seen a fine sample of sharp, angular, reefy gold, from Moraita, about 1½ oz., including one nugget of 5 or 6 dwts., and another of about 3 dwts. Another sample was from Olooloo, whence several good parcels of alluvial reef gold have been received. A nugget of about 13 oz. in weight has been found in that locality since that weighing 6 oz. was discovered.

We are informed that Messrs. Goodson and Chanders, who have been prospecting in the Echuca district for some time past, have made a most valuable discovery. It is stated that they have at the depth of 30 feet struck a reef 4 feet thick, and very rich, it being estimated that the stone bears 30 oz. of gold to the ton. This reef is about 1½ mile from the present Echuca Mine, and is pronounced by experts to be about the best ever found in the colony. The ore well as the Echuca Mine is presenting very encouraging indications. The reef is now down 140 ft., and the ore is seen floating on the water. The strata now being passed through is of a dark, almost black colour, and is of a greasy nature, of the consistency of and almost like car grease. There are found mixed with it decayed leaves and timber, and on one occasion when the rods were drawn the gas rose and spread over the surrounding padlock, and smelt most strongly of kerosene. A bottle of the fluid obtained at the strata last struck has been sent to Adelaide to be analysed. A number of gentlemen who have visited the spot have spoken highly of the prospects, and should the search for oil be successful, Mr. W. Malcom will be generously rewarded for his enterprise. It is asserted by those who profess to be experts, that coal will be also struck, as the country around exhibits favourable indications.

The long drought from which the colony has been suffering seems to have at last broken up. From all parts of the country telegrams have been received announcing the welcome downpour, and the fall of rain appears to have been not only general, but comparatively speaking heavy. The farmers are in high spirits owing to the change. For a long time the land has been baked so hard as to prevent the beginning of ploughing operations except on a limited scale, but the agriculturists will now be able to set to work in good earnest.

—*South Australian Advertiser*, April 28.

BURRA BURRA MINE.—The application made to work the Burra Mine on tribute is not yet decided by the directors.

—*Sydney Morning Herald*, April 28.

CLEMINSON'S FLEXIBLE WHEEL BASE.—The abnormal friction between wheels and rails in going round curves when the wheels are mounted in the usual way has been recognised almost as long as passenger rails have been in use, but although innumerable remedies have been tried they have usually proved worse than the disease. On a straight line a vehicle with parallel axles requires very little guidance by the flanges or rails; indeed, the tendency of such a vehicle in motion is to pursue obstinately a straight course, and it is only caused to depart from it by side pressure on flanges and rails. The object sought is to change the direction of the motion, and thus bring the train round the curve with the smallest possible friction on either rails or wheels—friction of course representing costly wear and tear. The difficulty appears to have been completely and satisfactorily overcome by Mr. James Cleminson, of Westminster, who mounts each carriage on three separate frameworks, each independent of the other, although attached to it. The framework carries the journals and axle guards, springs, &c., so that each pair of wheels automatically adapts itself to the road, whether straight or curved, and the friction is reduced to the minimum. The engineer of the South Indian Railway, amongst many others, certifies to the superiority of the Cleminson carriages, remarking that in the first place they carry 80 passengers as against 40 of the ordinary type, being double the number. They are supported on three pairs of wheels instead of on four pairs, which two ordinary thirds would require, thereby showing a saving of a pair of wheels, springs, axleboxes, and certain other ironwork connected therewith. The saving of a pair of wheels means considerable reduction in the wear and tear of rails, renewals of wheels, &c. The total length of the Cleminson carriage from outside to outside buffer is from 40 ft. 10 in., as against 44 ft. 8 in. of two ordinary third class carriages, showing a saving of 3 ft.

10 in. in the length over two ordinary thirds, without taking into account the space between the two carriages, which would offer considerable extra resistance against the air when running. With respect to the behaviour of the long frame carriages on entering and leaving curves, he considers they are practically quite a success, as they run with perfect ease, and show no signs of grinding or wear of the flange of the tyre against the rails, which would be sure to be noted if there was any rigidity in the action of the bogies. The Cleminson carriages are in every way satisfactory, and a train of them is much easier hauled by an engine than a similar train of ordinary carriages, as they offer less resistance to the wind, and are on fewer pairs of wheels. This view is confirmed by the engineers of railways in almost every civilised country—a fact which at once shows the practical value of the invention and the wide extent of its adoption.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine shareholder, Redruth (June 15), writes:—We have had a quiet market this week, and prices of a few mines declined. Wheal Bassett and Killfretts were the most dealt in, and these have advanced. Carn Brea fell 2½, Cook's Kitchen 1, New Cook's Kitchen ½, Pedn-an-drea ¼, Tincroft 1, and West Bassett 1½. To-day Killfretts, Wheal Bassett, and East Pool are in demand. No change of the Cornish tin standards has been announced. Subjoined are the closing quotations:—Blue Hills, 1½ to 1½; Carn Brea, 12½ to 13; Cook's Kitchen, 35½ to 36½; Dolcoath, 70 to 71; East Blue Hills, 10½ to 11½; East Lovell, 1½ to 1½; East Pool, 53½ to 53½; Killfretts, 5½ to 6½; Mellanear, 4½ to 4½; New Cook's Kitchen, 6½ to 7½; New Kitty, 1½ to 2½; North Bury, 3½ to 4; Phoenix, 2½ to 2½; South Condurrow, 8½ to 9½; South Crofty, 10½ to 11; South France, 12 to 12½; Tincroft, 13½ to 14; West Bassett, 11½ to 12; West Pool, 11½ to 12; West Polbrean, 11½ to 12; West Pollice, 5 to 5½; Wheal Bassett, 10 to 10½; Wheal Bury, 12 to 13; Wheal Gear, 14½ to 15½; Wheal Hony and Trelawney, 2½ to 2½; Wheal Killfretts, 1½ to 1½; Wheal Polbrean, 9½ to 10; Wheal Prussia, ¾ to ¾; Wheal Ury, 3½ to 3½; Wheal Jane, ¾ to 1.

—Mr. J. H. REYNOLDS, stock and share broker, Redruth (June 15), writes:—There has not been much business doing last two or three days, consequent on the fortnightly settlement being on, and tin hardly so firm owing to some French failures. To-day, however, there is a little better enquiry for most shares. Wheal Bassett has advanced to 10½ buyers; the lode continues to open out well, and the stamps are doing their work well. Killfretts firm at 5½. 18s. 6d. North Bury 12½ to 13; Carn Brea 12½ to 13; Cook's Kitchen 35½ to 36½; Dolcoath 70 to 71; East Blue Hills 10½ to 11½; East Lovell 1½ to 1½; East Pool 53½ to 53½; Killfretts 5½ to 6½; Mellanear 4½ to 4½; New Cook's Kitchen 6½ to 7½; New Kitty 1½ to 2½; North Bury 3½ to 4; Phoenix 2½ to 2½; South Condurrow 8½ to 9½; South Crofty 10½ to 11; South France 12 to 12½; Tincroft 13½ to 14; West Bassett 11½ to 12; West Pool 11½ to 12; West Polbrean 11½ to 12; West Pollice 5 to 5½; Wheal Bassett 10 to 10½; Wheal Bury 12 to 13; Wheal Gear 14½ to 15½; Wheal Hony and Trelawney 2½ to 2½; Wheal Killfretts 1½ to 1½; Wheal Polbrean 9½ to 10; Wheal Prussia ¾ to ¾; Wheal Ury 3½ to 3½; Wheal Jane ¾ to 1.

—Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (June 15), write: A fair amount of business has been done in Wheal Bassett, East Pool, and Killfretts. Closing quotations annexed:—Blue Hills, 1½ to 1½; Carn Brea, 12½ to 13; Cook's Kitchen, 35½ to 36½; Dolcoath, 70 to 71; East Blue Hills, 10½ to 11½; East Lovell, 1½ to 1½; East Pool, 53½ to 53½; Killfretts, 5½ to 6½; Mellanear, 4½ to 4½; New Cook's Kitchen, 6½ to 7½; New Kitty, 1½ to 2½; North Bury, 3½ to 4; Phoenix, 2½ to 2½; South Condurrow, 8½ to 9½; South Crofty, 10½ to 11; South France, 12 to 12½; Tincroft, 13½ to 14; West Bassett, 11½ to 12; West Pool, 11½ to 12; West Polbrean, 11½ to 12; West Pollice, 5 to 5½; Wheal Bassett, 10 to 10½; Wheal Bury, 12 to 13; Wheal Gear, 14½ to 15½; Wheal Hony and Trelawney, 2½ to 2½; Wheal Killfretts, 1½ to 1½; Wheal Polbrean, 9½ to 10; Wheal Prussia, ¾ to ¾; Wheal Ury, 3½ to 3½; Wheal Jane, ¾ to 1.

—Mr. M. W. BAWDEN, Liskeard (June 15), writes:—The mining market has been exceedingly dull and inactive, owing to the depression on tin on reported heavy failures in Paris, and usual seasonal intervening. To-day there is a little more animation with buyers of most stock at the present reduced prices for a rise. At West Phoenix mine meeting held at the mine on Friday last a call of 1s. 6d. per 12,000th share was made. Subjoined are the closing quotations:—Bedford United, 13½ to 14; Carn Brea, 13 to 13½; Cook's Kitchen, 35 to 35½; Dolcoath, 69½ to 70; Devon Consols, 7 to 7½; East Caradon, 3½ to 3½; East Herodotus, 5½ to 6; East Pool, 53 to 53½; Ganton United, 3½ to 3½; Glasgow Consols, 5½ to 6; Gunnslake Clitters, 2½ to 2½; Herodotus, 5½ to 6; Hingston Down, 5½ to 6; Killfretts, 5 to 5½; Marke Valley, 3½ to 4; New West Caradon, 3½ to 4; North Herodotus, 5½ to 6; Old Gunnslake, 5½ to 6; Phoenix United, 2½ to 3; Prince of Wales, 3½ to 4; South Caradon, 11½ to 12; South Condurrow, 8½ to 9; South Croft, 10½ to 11; South France, 12 to 12½; Tincroft, 14 to 14½; West Bassett, 11 to 11½; West Caradon, 3½ to 4; West France, 9½ to 10; West Mary Ann, 3½ to 4; West Mary, 11 to 11½; West Phoenix, 5½ to 6; West Seton, 15 to 15½; Wheal Aar, 14 to 14½; Wheal Bassett, 10 to 10½; Wheal Bury, 12 to 13; Wheal Gear, 14½ to 15½; Wheal Hony and Trelawney, 2½ to 2½; Wheal Killfretts, 1½ to 1½; Wheal Polbrean, 9½ to 10; Wheal Prussia, ¾ to ¾; Wheal Ury, 3½ to 3½; Wheal Jane, ¾ to 1.

—Mr. J. J. CARTER, mine shareholder, Camborne (June 15), writes:—Prices have ruled lower in the market during the week, but at the close to-day Wheal Bassett has recovered to 10½ buyers and Killfretts to 5½. 18s. 6d. Subjoined are the closing quotations:—Carn Brea, 12½ to 13; Cook's Kitchen, 35 to 35½; Dolcoath, 70 to 70½; East Pool, 53½ to 53½; East Blue Hills, 10½ to 11½; East Lovell, 1½ to 1½; East Pool, 53½ to 53½; Killfretts, 5½ to 6½; Mellanear, 4½ to 4½; New Cook's Kitchen, 6½ to 7½; New Kitty, 1½ to 2½; North Bury, 3½ to 4; Phoenix, 2½ to 2½; South Condurrow, 8½ to 9½; South Crofty, 10½ to 11; South France, 12 to 12½; Tincroft, 13½ to 14; West Bassett, 11½ to 12; West Pool, 11½ to 12; West Polbrean, 11½ to 12; West Pollice, 5 to 5½; Wheal Bassett, 10 to 10½; Wheal Bury, 12 to 13; Wheal Gear, 14½ to 15½; Wheal Hony and Trelawney, 2½ to 2½; Wheal Killfretts, 1½ to 1½; Wheal Polbrean, 9½ to 10; Wheal Prussia, ¾ to ¾; Wheal Ury, 3½ to 3½; Wheal Jane, ¾ to 1.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share brokers, Queen's Chambers, Market-street (June 15), write:—Several well defined movements are to be chronicled this week, and the concerns, or batch of concerns, in which the movements have taken place have by far the lion share of the business of the week. Most speculative stocks, owing to the critical state of affairs in Egypt, have ruled dull, and dropping, but to-day figures have shown some improvements. The business in shares other than rails is of a moderate amount, and, as a rule, figures realised on transactions compare favourably with those lately obtained. Quotations, on the whole, are fairly steady, though insurance show distinct, and iron, &c., and mining a slight preponderance of adverse changes. Bays without change of moment. A small general business doing at or about best rates. Alterations in prices is no case noteworthy, and figures quiet steady. Higher—National Provincial of England, new, ½ (now ex div. and b); Lancashire and Yorkshire, ½; and Manchester Joint Stock, ½. Lower—Manchester and Salford, ½.

INSURANCE.—As previously recorded, the quotations herein show a large balance of changes for the worse; there are very few, however, whose figures are seriously altered. Higher—Ocean Marine, ½, and Reliance Marine. London and Lancashire Western Fire shares, which recently have declined severely, are somewhat better to-day, showing rather better figures than sellers found a difficulty in obtaining only a few days ago, and are offering at a price, even at advanced rates. Lower—Liverpool and London and Globe, ½; Royal (Liverpool), ½; Thames and Mersey Marine, ½; British and Foreign Marine, ½; Lancashire, ½; Manchester Fire, ½; Maritime, ½, and Queen, ½.

COAL, IRON, & MINING.—Though in several cases enhanced figures are marked lower prices are in a majority. Bolckows are again irregular in changes, but this week the movements are reverse, fully paid being easier and 12s. paid better. In Bolckows several fluctuations are recorded. On Friday last the dividend announcement being disappointing prices rapidly fell, but they have since rallied, and after minor ups and downs to-day show only ¾ below figures of a week ago. Canadian Coppers were done as low as 23s. on Saturday last, but on Tuesday 25s. and 24s. 9d. was marked, and quotations now are substantially the same as last week's. Bolckows fully paid have been repeatedly at slightly advancing rates, latest dealing marked being at best price of the week. Indian gold mines have lost some of the late advance, those quoted here being all more or less lower. Cammells after having been credited with some advance are now easier, and Rio Tinto, though still showing small rise, have not maintained best of the week. Higher—Tredegar Coal and Iron, B. ½; John Brown's, ½; Gas Light and Coke ordinary, A. 1; Rio Tinto, ½; Bolckows 12s. paid, ½; and Chilling in iron, ½. Lower—Palmer's Shipbuilding, A. 1; Thariss Sulphur, &c., 1; Parkgate Iron, ½; A. Knowles and Sons, ½; Cammells, ½; Ebbw Vale Steel, &c., ½; Indian Phoenix Gold, ½; Indian Trevelyan, ½; and Indian Glenrock, ½; and Bolckows fully paid, ½.

COTTON SPINNING AND MANUFACTURING.—The upward movement in these shares continued to manifest itself up to Tuesday last; since then, however, a full has been noticeable, and though figures are not notably much altered sellers are more easy to deal with in most shares than was the case during the first few days of the week.

TELEGRAPH.—Little passing here, but figures in all cases of change show advance. Anglo-Ordinary are 1½, ditto Deferred 1½ and Preferred ¾, and Western and Brazilian ½ higher. In Telephones, Lancashire and Cheshires have been done a few times at or about quotations. Figures show United ¾ higher, and Lancashire and Cheshires 3 lower.

RAILWAYS.—Little passing here, but figures in all cases of change show advance. Anglo-Ordinary are 1½, ditto Deferred 1½ and Preferred ¾, and Western and Brazilian ½ higher. In Telephones, Lancashire and Cheshires have been done a few times at or about quotations. Figures show United ¾ higher, and Lancashire and Cheshires 3 lower.

The week has been the great demand for Canadian securities on the statement that rates would be raised on July 1. The bears have had a long time of it, and it is expected that traffic on the latter half of the year will come out very good, hence the marked change. Americans are influenced by the same news, and hopes are entertained that the Philadelphia and Reading Company will come out of the receiver's hands on July, and the new policy will be immediately inaugurated, so that their issues have been freely bought, and exhibit important advances. All others are more or less favourably affected; the tone is very good. Ohio and Mississippi, Ontario, and Marietta and Cincinnati seemingly worth attention.

NEWCASTLE-ON-TYNE STOCK EXCHANGE.—Mr. FARADAY SPRING, stock and share broker, Grey-street, (June 15) writes: A fair amount of business has been transacted here this week, and prices generally are better. Barrow Hematite Steel shares are 12 to 12½, and preference 11 to 11½. Bede Metal and Chemical shares are wanted at ¾, whilst sellers ask ¾ dis. Bolckow, Vaughan, and Co.'s 20s. paid shares are 27½ to 27¾; 12s. paid shares, 3½ to 4 prem.; and pref., 2½ to 2½. Consort Iron shares have been done to-day at 19 prem., at which they are still offered. Consort Spanish Ore Shares: A large number of these shares have changed hands lately at 39s. 6d. and 40s., and 40s. 6d.; buyers now at 39s. 6d., and sellers at 40s. 6d. Darlington Steel and Iron shares are offered at 3½ without tempting buyers. John Abbot and Co.'s shares are offered at 31 dis.; no buyers. Palmer's Shipbuilding and Iron Co.'s A shares are offered at 25½, and B at 7½ discount. There are probable buyers at fractions below these prices. Skerrie Iron shares are 2½. Tees Side Iron and Engine Works ordinary shares are 1½ to 1½, and pref. par. Tyne Forge shares have been done at 7 prem., at which they are still offered. West Cumberland Iron and Steel shares have been done at 7½ dis., at which there are still buyers.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, sharebroker and ironbroker (June 15), writes:—During the past week the market has been quiet, owing to the unfavourable state of matters in Egypt, but trade reports are generally more cheerful, and the money market remains easy. The Board of Trade Returns for May are also very encouraging. Transactions now entered into are for the new account, June 23.

In shares of coal, iron, and steel companies the principal alteration has been an advance of 1s. 3d. in steel shares, from 6½ to 7½. 9d. Ebbw Vale are, however, 3s. 9d. lower, at 9½ (been 9½). In the Scotch pig-iron market the price of warrants has advanced from 47s. 1½d. to 48s.; owing to the improving tone caused by the American strike, as well as the returns issued by the Scotch ironmasters, showing a decrease of stocks in makers' hands of 40,849 tons since Christmas, deducting the increase of 10,189 tons showing in Connal's stores, there is thus an estimated reduction during the six months in the total stocks of about 30,660 tons, but of course the aggregate 910,000 tons is still very formidable. The production, however, is to be curtailed to the extent of six or six-furths at Govan, which are to be turned from ordinary on to hematite iron; the shipments are also large, so that there are numerous influences to cause a rise in prices, provided the speculative spirit sets in. Benhar Preference shares offered; Altamira are at 25s., ditto 7 per cent. bonds, 6½; Cardiff and Swansea Coal, 3s. 6d. to 4s. 6d.; Chatterley Iron, 6½ to 7; Llynvi and Tondy, 4s. 7d.; and Newport Abercrombie, 9 to 9½.

In shares of foreign copper concerns prices are generally easier, as the market for that metal has declined, owing to it is said, to failure of French speculators. Thariss declined to 40½, but have since recovered to about 40½. Bratsberg are at 32s. 6d.; Hungarian, 15s. to 20s.; Norway, 7s. 6d. to 12s. 6d.; Santa Cruz, 2s. 9d. to 6s. 3d.; York Peninsula, 4s. to 6s.; and ditto, preference, 13s. 9d. to 21s. 3d.

In shares of home mines there is no particular change in prices to notice. Wheal Lovell offered. Bell Vean are at 21s. 3d.; Carnarvon, 7s. 6d.; Carpell, 2s. 6d.; Caron, 2s.; Devon Friendship, 4s. to 5s.; Drakewells, 10s. to 12s. 6d.; East Caradon, 2s. 6d. to 5s.; East Wharfedale, 10s. to 10s.; East Roman Gravel, 10s. to 15s.; Great Polgoth United, 5s. to 7s. 6d.; Great Holway, 10s. to 10s.; Herodotus, 1s. to 1s.; Indian Kingdon, 3s. 9d.; Mellanear, 30s. to 100s.; Mounts Bay, 5s. to 7s. 6d.; New Penrose, 2s. 6d.; Old Shepherds, 2s. to 10s.; Prince of Wales, 8s. to 9s.; Pen-y-Osred, 7s. 6d. to 12s. 6d.; Parkeas, 3s. 6d.; Pennant, 10s. to 10s.; Pant-y-Mwyn, 5s. to 7s. 6d.; Pioneer, 10s. to 12s. 6d.; Polbrean, 2s. 6d.; Parys, 7s. 6d. to 10s.; Rhosmorris, 5s. to 6s.; St. Just United, 7 to 9; Sortridge, 4s. to 6s.; South Devons, 12s. 6d. to 17s. 6d.; Tankerville, 5s. to 7s. 6d.; Tamar, 7s. 6d. to 10s.; Trevelyan, 5s. to 10s.; West Chiverton, 24s. dis.; West Kitty, 8½ to 9; Wheal Corrie, 5s. to 60s.; Wheal Jane, 15s. to 20s.; and Wheal Owles, 8 to 8.

In shares of gold and silver mines prices have generally improved. Richmond have advanced from 27½ to 31. 3d. to 32. 15s. Akonkoses are at 8s. to 7s. 6d.; Carta Para, 10s.; Central Wynad, 10s. to 15s.; Dieu Donne, 1s. to 2s.; Devala Provident, 2s. to 5s.; Devala Central, 10s. to 15s.; Flagstaff, 5s. to 6s. 3d.; Gold Coast, 17s. 6d. to 22s. 6d.; Hoover Hill, 2s. 6d. to 5s.; Indian Trevelyan, 12s. 6d. to 16s. 3d.; Indian Kingdon, 5s. to 7s. 6d.; Indian Consolidated, 17s. 6d.; I.L.L., 1s. to 3s.; Kapangas, 15s. to 17s. 6d.; Mysore Reef, 2s. 6d. to 5s.; New Callao, 5s. to 10s.; Nine Reefs, 7s. 6d. to 10s.; New Gold Run, 3s. 6d.; ditto preference, 4s. 6d.; Ouregones, 5s. to 10s.; Quartz Hill, 3s. to 5s.; Rio Grand do Sul, B. 20s. to 35s.; Silver Peak, 2s. 6d. to 5s.; Simon's Reef, 2s. 6d.; Teoma, 2s. 6d.; Tambourary, 20s. to 25s.; and Wala Wynad, 2s. 6d.

In shares of oil and miscellaneous companies there has not been much business. Glasgow Coal Exchange are at 18s.; Law's Chemical, 9½ to 6, ditto preference, 10 to 10½; and Newcastle Chemical, 30s. to 35s.

EDINBURGH.—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (June 7), write:—Home railway stocks have been very heavy during the last week. The weakest stock has been Brighton Deferred, which has fallen from 140 to 135. Caledonian has receded from 107½ to 107; Glasgow and South-Western from 119½ to 119; Great North of Scotland from 60½ to 59½. North British have been comparatively steady, and at 82½ shows only a reduction of ¾. Great Western has declined from 143½ to 142½; Midland from 140½ to 139½; North-Eastern from 171½ to 170; Highland Main Preference has advanced from 129 to 130; Highland B. from 122 to 122½; Perth and Dundee from 150 to 153; Great North of Scotland 4½ per cent. Debentures stock from 109½ to 110½. Canadians have had an important rise. Grand Trunk Ordinary has risen from 17½ to 18½; the First Preference from 100½ to 101½; the Second from 83½ to 87½; the Third from 38½ to 43½. Great Western of Canada shares from 139½ to 147½. American generally show a decided improvement. In Banks, Banks of Scotland has risen from 22½ to 23½; British Linen from 285 to 287½; Commercial from 55½ to 56; National from 352 to 353; Union, from 24½ to 24½. In Insurance, shares there have been no changes worth mentioning. In mines, Rio Tinto has receded from 24½ to 24; Ariston Coal from 11½ to 10½; Clyde Coal from 4s. 6d. to 40s. Brexburn Oil have declined from 28½ to 28; Burntisland Oil from 107½ to 10½. Young's Farafin have improved from 10 to 10½; Dalmeny Oil, from 18½ to 19; Hudson's Bays have advanced from 36½ to 33½. Edinburgh and Leith Gas have receded from 31½ to 31.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (June 14) write:—Markets were dull to-day, and Great Southern changed hands at 114½, while Midlands were done at 84½, and Bandon was offered at 80. No change in Macrooms or Limericks. National Banks were done at 23½, and Munsters at 7½. Hibernians also changed hands at 31½ to 32. No change in provincials. Cork Steam Packets were done at 10, and Lyons at 5½. No change in Gas shares. Goulding's remain 8½, and Gresham Hotels were asked for at 3½. Dalsys were also buyers at 2½, and Breweries at 5. Harbour Board Debentures asked for at 102½.

QUEENSLAND TIN.—A telegram from Brisbane (May 17), via San Francisco, says that an important tin lode is reported to have been discovered in the neighbourhood of Nomanby River, whence samples of almost pure tin with quartz veins have been received. The Governor opened the Sandgate Railway on May 10.

SPANISH TIN COMPANY.—The petition for winding-up this company, presented by Mr. C. J. Partington, of South-square, Gray's-inn, will be heard in the Chancery Division of the High Court of Justice, before Mr. Justice Fry, on June 23. Messrs. Peacock and Goddard, of the same address as the petitioner, are the solicitors.

THE BADDELEY COLLIERY ACCIDENT.—We have much pleasure in recording the following instance of enlightened liberality on the part of our oldest and largest accident company. The circumstances were such as to cause some embarrassment; the voluntary exposure to an excluded risk obviously vitiated the assurance, while, at the same time, the motive for such exposure challenged admiration and sympathy. It will be remembered that on May 2 last an explosion took place at the Baddeley Colliery, in Warwickshire, by which several miners were entombed. A party of volunteers was organised to endeavour to rescue them, headed by the agent of the colliery, Mr. J. Pogmore. Unfortunately, a second explosion followed, by which Mr. Pogmore and several other gentlemen were severely burned that they died from the injuries received. Mr. Pogmore held a policy against accidents with the Railway Passengers' Assurance Company; but not thinking that he ran any risk underground, he had preferred to pay only the ordinary rate of premium, on condition that that special risk should be excluded, and under this condition his family had therefore no legal claim. But as he met his death in an heroic attempt to save the

lives of others, and the company have always recognised that under such circumstances their clients are entitled to special consideration, the directors agreed to hold the policy good for the amount which the premium actually paid would have secured had it covered the professional risk, and they presented the widow with the sum of 500*l*. It is satisfactory to know that this generosity has been duly appreciated by the family, as it doubtless will be by those insured with the company, and by the public.

Meetings of Public Companies.

THE RHODES REEF GOLD MINING COMPANY.

The second ordinary general meeting of shareholders was held on Monday, at the Cannon-street Hotel, Sir DAVID LIONEL SALOMONS, Bart., in the chair. Mr. ALFRED NEVILLE FREWER (the secretary), read the notice calling the meeting. The report and accounts were taken as read. There was a large attendance.

The CHAIRMAN said—Gentlemen, before commencing the business of this meeting I must refer to the sad loss which the board and the shareholders have sustained by the death of our late colleague, Mr. Rhodes, who, you know was connected with this movement from the very beginning, and perhaps through whom, to a very great extent, the gold mining industry of India was commenced. The board have passed a vote of condolence with Mrs. Rhodes, and I daresay it will be within the feeling of the meeting to pass a similar vote on the part of the shareholders. Since we met last time, over a year ago, General Light has visited the estates in India. It was all-important that someone should go there, for as you know, Mr. Brough-Smyth's health had failed him, and naturally things could not go on without a head over there, and as it was essential that someone should go over, General Light generously offered to do so. He is a gentleman well known to all of you by sight, and very many of you know him, no doubt personally. His ability is very considerable; he is a very able man, and having been in the army many years, he understands organisation particularly. To refer to a small portion of the services he has rendered, he has saved—keeping Devala-Moyar out of the question—the Rhodes Reef over 70*l*. a year, and perhaps considerably more; but apart from this, he has carefully gone through the accounts with Mr. Fotheringham, who is our agent, and has put them in a straightforward condition, and henceforward they will be kept in a form that the board in London desire. We have the great satisfaction of finding Mr. Gitchell to be an excellent man, and General Light considers him to be worthy of our entire confidence. The latest news sent in to us is very satisfactory. We sent out the following telegram:—"Rhodes Reef shareholders' meeting 12th inst., telegraph latest news." The answer comes, dated June 10:—"Wells and plates better than last crushing; reefs, especially the new one, looking well. Large quantity of pyrites with gold stored, but not yet tried." I think, on the whole, we cannot but consider the progress as satisfactory. With regard to the balance-sheet, I think you must all feel quite satisfied with the general working of the company. The balance in the company's favour is 48,000*l*. It is not likely we shall fall for want of funds, and probably before the end of the year we shall get a return from that which has been expended. Originally a complaint was made that a large price was paid for the property, it is satisfactory, therefore, to see that there shows well so far. The Chairman went on to say that experience went to show that they would be able to crush the amount estimated in the original prospectus. The only other point which he need refer to was that it was proposed the number of the board (as stated in the report), in future should be four instead of five, which would save a little expense to the company. In conclusion, the Chairman moved the adoption of the report and accounts.

Major-General ALFRED LIGHT, R.H.A., said—Gentlemen, I beg to second the resolution which the Chairman has read, and, in supporting it, propose to add a few remarks on the subject of my visit to the Wynaad to which Sir David has alluded. I proceeded to India at the request of my colleagues to readjust the management, examine into, and ascertain the position and progress of the company's operations, and I spent a month at the mines, and thus had a very good opportunity of forming an opinion as to our prospects. Before going further I may be satisfactory to you if I state at once and briefly that the conclusion I have arrived at is that Indian gold mining, if properly and economically conducted, will prove to be a great success. Gentlemen, those that can wait will, in my opinion, win; of that I have no doubt, and I am backing my opinion by continuing to hold the 1000 shares which were originally allotted to me. On arrival at Ootacamund I had an interview with our late engineer, Mr. Brough-Smyth, and I was sorry to find that his health had become so impaired that when he tendered his resignation I felt obliged to accept it. Mr. Brough-Smyth's chief regret in taking the step he did was that he would not be able to remain in India to witness the success of the industry, to the starting of which he had so largely contributed, and in the future of which he was as firmly convinced as when he addressed you on the subject here. Now, gentlemen, I need not trouble you with the many matters relating to the general conduct of business which engaged my attention, but I will at once proceed to matters of general interest. After much consideration and many enquiries I came to the conclusion that the company's interests would be well and faithfully served by committing the management of the mining department to the entire charge of Mr. Gitchell, the chief mining manager. To his skill and energy, and the perseverance and hard work of the whole of his staff, I attribute the fact (I think we may claim it without egotism) of our forward position in the field of operations, and of the confidence with which the public view this undertaking. Mr. Gitchell possessed the entire confidence of Mr. Brough-Smyth, and he is known throughout Australia as a skilful and successful mine manager. He is above all things practical and is withal a firm believer in the future success of the companies with which he is associated. He told me, incidentally, that Rhodes Reef was the 23th which he had put up, and characteristically remarked, "I will see his ideas about the Wynaad that he did not mean to leave the country until he had made a success of the companies with which he was connected, and also a 'pile' for himself. You know what that means, gentlemen. (Cheers.) In company with the staff, and alone also, I was engaged for many hours each day in outdoor inspection of your property. The amount of work accomplished surprised me, and I greatly admired the vigour which our men put into the day's work—working hard with only half-an-hour's cessation from seven in the morning until four in the afternoon. The hours are arranged at present because of the being in twilight, and it is only becoming light at six o'clock, and by four o'clock our fellows have had about enough for the day, and are glad to rest and have a few hours to themselves before darkness. Of course, when the works are in full swing arrangements will be made (they are indeed in process of organisation) for three shifts of men, so as to work continuously night and day. Rhodes Reef naturally occupied a great deal of my attention, and you will get some idea by the photographs on the table of the position it was in when I was there. On Feb. 20, Mr. Gitchell having reported everything to be in working order, I invited every mine manager in the district, as well as other friends, to meet and inspect the property, which was duly started, and certainly worked perfectly, and was universally admired—and the plant is indeed first-rate. Gentlemen, if you had been on the ground and seen, as I have, the nature of the workings, you would at once realise the fact that before we can get at the rich quartz at which the manager has lately been working, and obtain real paying results, an immense quantity of less auriferous quartz, several thousand tons must be put through the mill first. Therefore, I can only repeat have patience, and do not form conclusions hastily from the results of trial crushings. Every letter we get from the mines tells us that the lower we get the better becomes the ore, and this I have myself observed. Ataching, as I have said, very little importance to these preliminary crushings, I must say that the result lately published, and which I believe is the lowest we shall ever have, is not to be despised. On the contrary, 8 dwts. on a large scale would be a paying return, and I am convinced that you will see considerable improvement ere long; and according to the telegram read to-day, you have heard that the wells and plates are already looking better. I have placed some specimens on the table collected by myself, and I can assure you that they were not specially selected, but just pieces of broken quartz such as I or anyone could obtain for the trouble of picking up. Mr. Gitchell said that by the time I reached home all the visible gold would have shaken out, and that then it would be said that there was none. It has happened so to a considerable extent, but enough remains to convince you that there is gold in your property, and in paying quantities. There are also on the table two prospects from the new reef lately panned out by Mr. Gitchell from the fine stuff amongst the quartz. They speak for themselves, but I should add that if the quartz itself had been crushed there would probably have been a still better show of gold. The free gold in these prospects is unmistakable, and there is undoubtedly a large amount also in the sulphides, which can only be extracted by treatment. You will be glad to hear that Mr. Gitchell anticipates no difficulty in treating these sulphides and pyrites. And now, gentlemen, a word as to the old native workings, which have left a lasting impression on my mind. Their extent is wonderful in the extreme. The whole country, not only the hills but the valleys, has been rooted up and the flats have been washed over and over again. By standing some distance away and looking across at a ridge of country one can trace the indentations, which present a most curious appearance. The natives were continually breaking fresh ground, as at a certain depth they seem to have found the stuff too hard for them to penetrate but this was not always the case, for in the Devala-Moyar Company's property native workings have been discovered 300 ft. deep, but the majority did not get much below 50 ft. Let me describe to you but one of the old workings which I explored. Having climbed up a very precipitous path to nearly the top of a hill, we came to a small aperture about 2 ft. high. Preceded by a miner with a light I crawled upon my stomach into a short gallery, and entered one of the most extensive old workings which have yet been opened out. I went in about 50 ft., and the miner was on about 50 feet further—galleries and huge excavations being on every side of us, some partially filled with debris. Every inch of these large spaces must have been worked out by hand without the aid of machinery, and one cannot believe that such enormous works would have been carried out if large profits had not been obtainable by so doing. Others of these old native workings were described to me as caverns large enough to hold a regiment, and I have been interested to observe that a Greek author Megasthenes, who wrote 300 B.C., stated that the Wynaad gold mines were then in existence and being worked. What I want to impress upon you is the necessity for our adopting the course we are—working below and beyond where the natives delved, and not taking their leaveings, for many of these tunnels and shafts have fallen in and become filled with the country rock, which forms the walls of the reefs, and in which very little gold, if any, is to be found. One word as to the climate. So far from being deadly, it is quite the reverse, as you may judge when I mention that we have not had one real case of fever among our staff. Our property is, I consider, above the limit of the malaria, and for 10 months in the year the climate, for a tropical one, is good. April and May are very trying, but I can say this, that I have served in parts of India, compared with which the climate

of the Wynaad is healthy. Our Australian miners, who have now been in residence a whole year, laugh at the heat compared with that to which they have been accustomed (they think nothing of 85° to 90°); and Mr. Gitchell informed me that he had never yet slept without a blanket, the nights being always cool. Before sitting down I should like to bear testimony to the wonderful working capacity of our Australian miners. They are willing and able to turn their hands to anything, are very sober and enduring, they never grumble nor growl when they cannot get butler's meat or delicacies, but work on with a cheerfulness which astonished me, and they proved a great contrast to my experience of Europeans in India. As for Mr. Gitchell, my admiration for his energy is unbounded. In concluding, let me say that, if I can, I shall be most happy to answer any questions which may be addressed to me. (Cheers.)

The CHAIRMAN said that General Light went out for two companies, the Devala-Moyar and this company, and according to the Articles of Association, the directors could only give him at the rate of 500*l*. a year for each company, which would be 1000*l*. a year, supposing he had been managing director for one whole year for both companies. General Light was in India about three months, and the amount which the directors could give him was 125*l*. for each company, or 250*l*. altogether, though the directors felt that 500*l*. under the circumstances, would not be too much. The directors had paid General Light 125*l*. and it would be for the shareholders to say whether they considered that a sufficient amount.

Sir LEOPOLD HEATH said that, with regard to the general subject referred to by the Chairman, it might be satisfactory to the gentlemen present to know that he was connected with a gold mining company which was working at a profit, and which obtained only 4 dwts. to the ton.

The resolution for the adoption of the report and accounts was then carried unanimously. Colonel LLEWELLYN moved that the retiring directors, Sir David Lionel Salomons, Bart., and Major-General Alfred Light, be re-elected directors. The shareholders would have seen the great business capacity of Sir David Salomons, and the great grasp and power with which he had obtained a knowledge of the company's business in all its details, and the courtesy and clearness with which he had imparted that knowledge to those desirous of information. As to Major-General Light, they had all heard the result of his visit, and the fact that they had a gentleman of such high standing was a proof of the high standing of the company in the present, and the best guarantee they could have of its success in the future. Mr. DAWSON seconded the motion, which was put and carried.

The CHAIRMAN acknowledged the re-election of himself and colleagues. Mr. CORNELIUS SURGEY moved that the thanks of the meeting be presented to General Light for the services rendered by him in India, and that in recognition of the same the sum of 125*l*. be placed at his disposal, in addition to the remuneration which he may be entitled to under the Articles of Association. He believed this was a resolution which would be adopted unanimously. (Hear, hear.) They had seen that General Light was not only a gentleman of great ability, but could also express his sentiments with great clearness. He hoped and believed that what General Light had done in India had laid the foundation of the company's future prosperity, and therefore he had great pleasure in proposing the resolution. Mr. DON seconded the motion.

Mr. STAPLES thought the amount proposed was not an adequate remuneration for the services rendered, and he proposed that 250*l*. be awarded to General Light, in addition to the sum to which he was entitled to under the articles.

Mr. KEARS, Mr. VAN DUREN, and one or two other shareholders, whilst fully agreeing with the great value of the services rendered by Gen. Light, thought that it would be better to postpone a full recognition of the services of General Light till the shareholders had received some remuneration on their investment. With this understanding the amendment was withdrawn, and the resolution proposed by Mr. SURGEY was put and carried.

The retiring auditor, Mr. W. G. Goodlife, was re-appointed on the motion of Mr. BELLINGHAM, seconded by Mr. WAINWRIGHT.

Sir LEOPOLD HEATH seconded the appointment of the late Mr. Rhodes as passed, and with one of thanks to the Chairman and directors, the proceedings terminated.

UNITED SHEPHERDS WHEAL ROSE

An extraordinary general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Tuesday.

Mr. T. E. FOAKES in the chair.

Prior to the commencement of the proceedings Mr. BEALL (solicitor), who admitted that he was not a shareholder, was requested to leave the room which he had entered, claiming to be the representative of a shareholder. Mr. Beall, leaving the room, remarked that if the resolutions to be proposed were passed, the shareholders would lose every farthing of the assets of the company. (Laughter.)

The CHAIRMAN replied that that was a matter in which the interference of Mr. Beall would not be asked. (Hear, hear.)

Mr. WRIGHT (the secretary) read the notice convening the meeting, which stated that it was called to consider the position of the company, and if deemed desirable to pass resolutions to wind-up the company.

The CHAIRMAN said there was little to say beyond what was stated at the preceding meeting. He was very sorry that the company was to be wound-up, for he believed that with prudence and with the capital subscribed for paid up they would have had a good paying property. Everybody who knew the district believed the mine to be a very fine one, and affidavits had been made verifying 13 or 20 reports from experts who had visited the property, and stated that it was a very excellent one. They had paid 1750*l*. in cash for the property, and the balance was to be paid in shares, and nobody could say that that was an exorbitant amount to pay for such a property, having regard especially to the prices paid for neighbouring mines. However, they could not go on without capital and without the goodwill of the majority of the shareholders. A petition was presented to wind-up the company, but that petition was dismissed with costs, but if they had to fight every shareholder in arrears for calls they would have been involved in immense expenses which would have ruined any company. On that account, and on that account alone, his colleagues and he had decided that some arrangement had better be made to wind-up the company. That was the reason why the meeting had been called, but he wished it to be understood that he believed the property to be as good a one as any property in the neighbourhood, and that with the capital subscribed for paid up they would have made it all the shareholders' property. A circular had been issued by Mr. Beall, who had had nothing to do with the company, but who interfered in any company where he could serve his own interests. In this circular it was stated that he (the Chairman) had not paid his calls, but he had paid his calls six or eight months ago, and did not owe the company a shilling for calls, as Mr. Beall could have seen before sending out his circular, which was full of untruths from beginning to end. He had answered the circular, but he thought, on the whole, that it would be unworthy of any gentleman to answer such statements as Mr. Beall made in regard to this and other companies. The circular also stated that the directors had taken proceedings against shareholders who had paid 75 per cent. on their shares, but this was an equally inaccurate statement. As a matter of fact, very few shareholders had paid up so much. Proceedings had only been taken against those who could pay and would not. He had been very sorry to have to take such proceedings, but what was to be done. The directors had nothing to conceal, and he would be happy to give the fullest information in his power.

Mr. HENDERSON asked what was the legal position of the last meeting? Was it an extraordinary meeting at which resolutions were passed?—The CHAIRMAN replied that the directors did not like to take upon themselves the responsibility of settling the compromise in the terms of the agreement without the sanction of the shareholders, more particularly as the agreement embraced the settlement of the personal action brought against the directors in reference to the advertisements issued as to the prospectus. Therefore, a clause was inserted in the agreement that the settlement should not be binding unless the shareholders at a general meeting accepted it.

Mr. HENDERSON said the resolution was carried in the face of the opposition of a majority of the shareholders present at the meeting by proxies representing shares, some of which certainly had not been paid up upon them, and to his mind the proceeding was altogether an one-sided one, and it was not fair or equitable in any sense of the word that proxies should have been used to pass such a vote, when the majority of bona fide shareholders present

wished it to be delayed until the shareholders had a statement of accounts before them.

The CHAIRMAN replied that the directors did not use their own proxies, and that a large number of those shareholders who had sent proxies, and of the gentlemen who used them had paid their calls. The action was brought against the company as well as the directors to put an end to the contract, and incidentally the directors were made parties, because it was said that they ought not to have agreed to the contract.

The CHAIRMAN, in reply to questions, said the arrears of calls amounted to 5778*l*. of which 445*l*. appertained to the shares applied for by Mr. Hearnshaw. They might fairly suppose that a great deal of this amount was good. He did not anticipate that there would have to be any call beyond the 1*l*. per share, and he hoped that there would be some return. He could not say what the legal costs would amount to until they were settled and taxed. His colleagues and himself would not take any more fees from the company.

Some discussion then took place with regard to the appointment of liquidators, in the course of which Mr. Henderson was asked to be one of the liquidators, but declined to accept the office. Eventually the following resolution was carried with one dissentient:—"That this company be wound-up voluntarily under the provisions of the Companies Acts 1862 and 1867, and that Messrs. Good and Gulland be appointed liquidators for the purpose of such winding-up at a remuneration of 75*l*. each."

The meeting then closed with the usual compliment.

RIPON GOLD MINING COMPANY.

A meeting of shareholders was held at Bombay on May 19 to receive the report of the directors for the period ending March 31, Mr. D. MANOCKJEE PETIT in the chair.

The directors reported the return of Mr. Ralph Hill, the company's resident engineer, from Australia, where he purchased a complete battery of 20 head of stamps with boiler, engine, amalgamator, and other accessories, costing in Australia about 2350*l*. The machinery, which was made by the Langlands Foundry Company, Melbourne, and is reported to be in every respect satisfactory and of first-class make, has now arrived at Madras, and every effort is being made to convey it to the mines before the rainy season sets in. During Mr. Hill's absence the mining operations have been carried on under the direction of Captain Trezise. Mr. Hill has now reported on the progress made during his absence, and also on the present prospects of the mine. The board hope that if the machinery can be carried to the mine before the rains set in, the crushing operations may be commenced before the end of the year. The expenditure up to March 31, including purchases of machinery in England and Melbourne, amounts to about Rs. 131,400. The cash balance on the same date was Rs. 17,909, and the amount due for overdue calls was Rs. 29,187-6, now reduced to Rs. 5035. The board have experienced considerable difficulty in obtaining payment of the calls from some shareholders, but in the interests of the company, and of those who have paid their calls, measures are being taken against those shareholders who are in arrears with their payments. The board have resolved to call up the remaining instalments due on the A shares by calls of 2*l*. each, the first payable June 15.

Mr. Hill reports that No. 2 reef averages 2½ ft. in width. Some parts of the stone are better than others, but taken altogether it should crush from 8 to 10 dwts. per ton. He has never seen a finer looking lode than No. 3 reef in any of the hills and sun shafts, but the reef does not go down, at least the surface reef, in it now, or pyrites either. The stone at present is poor, but we have, he continues, found visible gold in the stone several times, and can get gold in any of the stone by crushing it, and it should pay for crushing. But I feel sure this reef will make good gold; if not at this level, it will deeper down. Another point—this lode is underlying west at about an angle of 25°, and as No. 2 reef is underlying east, these two reefs must intersect each other at a certain depth. In such cases, which I have seen in Australia and other places, it very seldom fails to make a good and very often rich lode where two gold-bearing lodes, such as No. 2 and No. 3 reefs, meet. The plan to prove an I work this is to sink a good perpendicular shaft between the two reefs. Of this I shall say more on another occasion, as we have plenty of work and quartz before us for a long time. On No. 4 hill there is a very large outcrop, and we have driven into the hill and sunk shafts, but the reef does not go down, at least the surface reef. I have not the slightest doubt that this reef (No. 3 reef) will make again under a shaft at a deeper level, as this is the same as No. 3 reef, only it has deepened south from No. 3 hill under No. 4 hill. Nothing has been done to No. 1 reef during my absence. We have started again to sink a shaft, but this is off the order. When we get deep enough we shall drive for the lode. There is a lot of quartz about this reef that will go from 5 to 7 dwts. or more, as we can find visible gold at any time. These are the simple facts connected with the mine as it is at present, and if the machinery were ready to start crushing, I am convinced that what I have told you would be realised. We have no 4 oz. stone or 70 oz. to the ton in the pyrites, but we have stone that will pay the shareholders for their outlay, and, if it lasts, will make a good profitable mine. With the advantages we have for working the mine at the present level 4 dwts. to the ton should clear all working expenses. Perhaps less would do so.

The machinery arrived in Madras on April 12, and our Calcut agents will, I have no doubt, make haste to send it to the mine. You will no doubt ask when I shall get the machinery erected and ready for a start, but this I cannot say yet. It will greatly depend on the labour, get, or if there is any delay in getting the material. At present we have got nearly all the logs for the foundation of the battery, and some of the logs have been put in their places. The dam has been started, and I intend to get on with all the work as quickly as possible. In conclusion, I may say that up to the present time I see no reason to doubt that the mine will not only be a payable one, but it promises well to be a valuable property; and I hope the agents and directors will assist me as much as possible in carrying out the work.

EMMA SILVER MINING COMPANY.—A special meeting of shareholders was held on Friday for the purpose of considering the advisability of purchasing the Cincinnati property and increasing the capital of the company. Mr. Snell presided. The report of the committee appointed to consider the proposed purchase stated that the two properties—the Cincinnati and Emma—were so close together as to give ground for much dispute, which might, and probably would, lead to expensive and tedious litigation as to boundaries, and also the right to any underlying bodies of ore which might be discovered on either property, that the Cincinnati property included a part of a vein which was represented as having yielded in the past large amounts of ore to the Emma, the Flagstaff, and other companies on the Emma Hill, and that it could be conveniently worked in conjunction with the present property without any additional expenses for management or machinery. After considerable negotiation, the owners of the property have been induced to accept 8500 fully paid-up shares in the company. The committee recommended the purchase on these terms. The Chairman said that the committee believed that the purchase of the Cincinnati property would save the company from vexatious litigation, and they believed that in itself it was a valuable property. The company had no money to spend in litigation, which would certainly take place if they found ore in the Emma Mine, and were not at the same time the proprietors of the Cincinnati property. The title to the latter was clear. The committee had received replies which showed a preponderance of opinion in favour of the purchase. After hearing an explanation from Mr. Bennet of the condition of the Cincinnati property it was agreed to purchase it, and to increase the capital of the company from 705,000*l*. to 765,000*l*.

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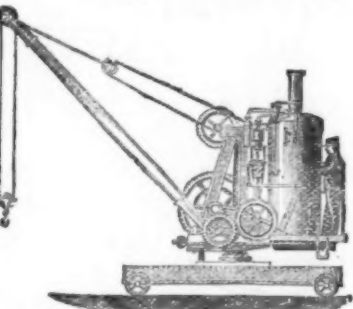
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ANTI-CORRODION TUBES AND FITTINGS COATED BY BARRETT'S RUSTLESS PROCESS.



TUBES

FOREIGN MINING AND METALLURGY.

Considerable activity still prevails in the French industrial districts, as well as upon the Paris iron market. The competition of Belgian iron alone prevents, it is considered, an advance in prices. Merchants' iron remains at 87. 4s. per ton. There is little change to report in the general aspect of the German iron trade. The demand remains rather feeble for iron and pig, but the enquiry for plates has become considerably more active, while the steelworks are extremely well employed. Manufacturers of plates have decided not to advance their rates for boiler-plates, although some of them are extremely pressed with orders. The exports of iron and steel from Germany in the first four months of this year amount to 226,000 tons, as compared with 231,000 tons in the corresponding period of 1881. The production of the ironworks of Germany and the Grand Duchy of Luxembourg amounted to 241,890 tons—146,409 tons of puddled iron, 12,108 tons of speiseisen, 57,631 tons of puddled pig, and 10,339 tons of casting pig. The corresponding production in April, 1881, was 226,012 tons. In the first four months of the current year the aggregate production of the ironworks of Germany and the Grand Duchy of Luxembourg was 1,025,144 tons, against 889,071 tons in the corresponding period of 1881. The aggregate exports of coal from Germany in the first four months of this year were 2,198,000 tons, as compared with 2,201,000 tons in the corresponding period of 1881. The aggregate exports of coke from Germany in the first four months of this year amounted to 157,000 tons, as compared with 126,000 tons in the corresponding period of 1881.

The downward tendency which has been noticed of late in the Belgian iron trade appears to be checked. Iron has been held with some firmness at 57. 4s. per ton; all attempts to do business upon lower rates have proved unsuccessful. Even industrials, who had published tariffs below this standard, appear to have withdrawn them. English casting pig has been quoted upon the Belgian markets at 27. 8s. per ton, while the Athus Company have done business easily at 27. 10s. per ton. Girders have made 57. 12s. per ton upon the Belgian markets. Plates have been a little firmer, at from 77. to 77. 4s. per ton, the latter being the price most readily admitted. Boiler plates have made 87. per ton. If prices of steel and iron do not advance in Belgium, it at any rate may be said that work does not make default in most of the industrial establishments of the country, and especially in the steelworks and the construction workshops. The John Cockerill Company has just received from the Orleans Railway Company an order for 10 large passenger locomotives with tenders. These engines are to be delivered in the course of 1883. The John Cockerill Company has further received an order for all the plant required for some steelworks in the Charleroi district. The amount of the orders which the John Cockerill Company has now on hand is something over 960,000l., and the number of workmen which the company employs either in its collieries and ironworks at Seraing, in its Hoboken shipbuilding yard near Antwerp, on board its steamers, and in its mineral works in the Luxembourg and in Spain, is now more than 10,500. Greater activity, indeed, has never prevailed in the various departments of the operations of the John Cockerill Company than is now noticeable in them. It appears that the imports of iron minerals into Belgium in the first four months of this year amounted to 385,671 tons, as compared with 325,653 tons in the corresponding period of 1881. Iron rails were exported from Belgium in the first four months of the year to the extent of 6246 tons, as compared with 7399 tons in the corresponding period of 1881, while plates were exported in the first four months of this year to the extent of 11,936 tons, as compared with 12,005 tons in the corresponding period of 1881.

The condition of the Belgian coal trade continues favourable in the different producing districts. Deliveries are regularly maintained and the same may be said of prices. In the Couchant du Mons the upward tendency which has been observed of late in quotations has become more decided from week to week, while in the Liège basin the production is readily disposed of. Several of the collieries are still not working on Mondays, but the measure is not general. Some colliery proprietors are not even able to keep pace with the orders which come to hand. A sign of confidence in the future is found in the fact that it is seriously proposed to start certain collieries which have been stopped. Although some German colliery proprietors have reduced their tariffs 10d. per ton, rates for coal have been generally fairly well maintained upon the Belgian markets. The imports of coal into Belgium in the first four months of this year are returned at 289,603 tons, as compared with 301,721 tons in the corresponding period of 1881. In these totals English coal figures for 74,023 tons and 77,726 tons respectively. The imports of coke into Belgium in the first four months of this year amounted to 5836 tons, as compared with 7965 tons in the corresponding period of 1881. The imports of combustibles have thus sensibly diminished. This observation applies to coal as well as to coke. The exports of coal from Belgium in the first four months of this year come out at 1,208,525 tons, as compared with 1,223,181 tons in the corresponding period of 1881. The exports of coke from Belgium in the first four months of this year amounted to 863,346 tons, as compared with 319,048 tons in the corresponding period of 1881. In the exports of coal the deliveries to France figured for 1,138,197 tons in the first four months of this year, against 1,151,712 tons in the corresponding period of 1881. The exports of coke to France were 307,190 tons, and 263,548 tons respectively. The German coal trade has continued weak.

PRECIOUS METALS IN THE UNITED STATES.—Mr. Clarence King, of the Census Bureau, has issued his preliminary report on the production of the precious metals in the United States. The statistics relate to the year ended May 31, 1880. Mr. King explains that the method employed by the Mint is simply that of summarising the receipts of domestic bullion at the several mints and United States assay offices, adding to this the amount shipped abroad as shown by Custom House returns, and estimating the amount consumed in the arts. The total value of the production of the deep mines during the period above-mentioned was \$62,381,448; that of the placer mines, \$12,109,172. Taking all mines, the gold production of the United States amounted to \$33,379,663, of which total California alone claimed more than half; the silver production amounted to \$41,110,957, of which total Colorado claimed upwards of \$16,000,000, and Nevada upwards of \$12,000,000. The State of Utah showed a production of nearly \$5,000,000. The great deposits of auriferous gravel in California continue to yield largely, "though their final exhaustion under the wholesale hydraulic operations now being actively prosecuted cannot be far away." Silver California produces but little, but this state furnishes 71.47 per cent., or nearly three-fourths of the total placer product of the country, and 40 per cent. of the total gold product of the deep mines, or between 51 and 52 per cent. of the total gold product of the United States. Although the mining industry of Nevada is still great, it shows a considerable increase, in consequence of the diminished yield of the Comstock lode. For eight years, that is, from 1871 to 1879, Nevada stood at the head of the states and territories as a producer of the precious metal, but during the census year both California and Colorado outstripped it. In 1876 the Comstock yielded a total of \$38,572,984, but during the census year the product of the whole Comstock district was but \$6,922,330, an amazing decline in so short a period. In Utah the bullion produce is remarkably steady. Up to the year 1877 Colorado was not noticeable for any considerable production of the precious metals, but with the discovery of the silver deposits at Leadville, it has suddenly come to the front, ranking first for its silver output and fourth for its gold. In the census year its production of gold and silver was in round numbers 19½ millions, and adding this to the value of lead and copper produced, the total metallic product was 22½ millions. Mr. King deals with the production of each state separately, and in closing his report, expresses his conviction that the outlook for the future of the mining industry in precious metals is very promising. This has been borne out by a non-official report just issued for the year 1881, which gives a total production of \$76,947,515, the proportions being—of gold, \$31,869,686, and of silver \$45,077,829.

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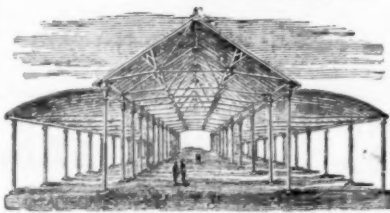
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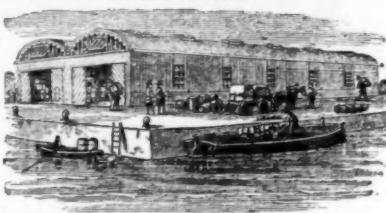
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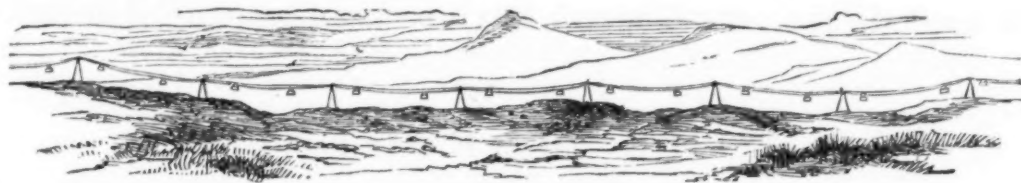
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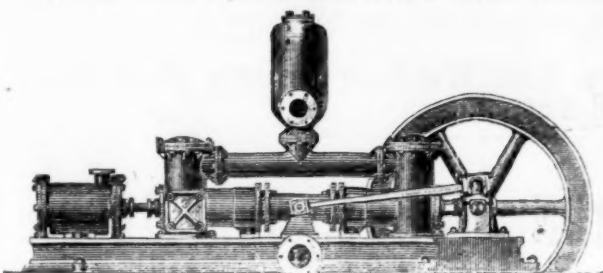
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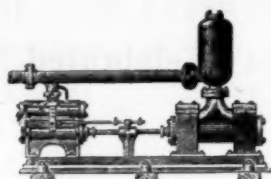


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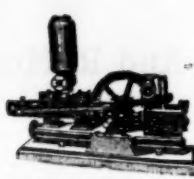
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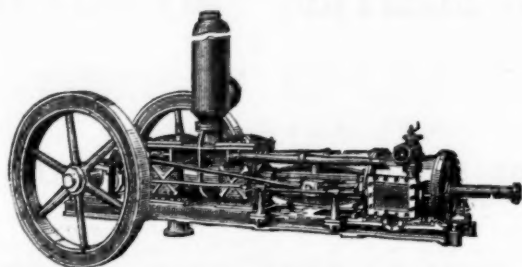
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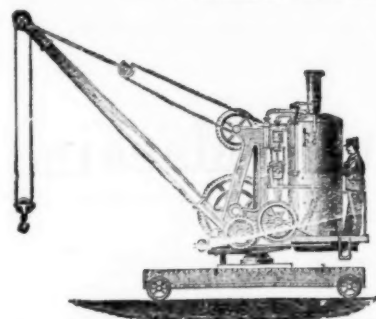
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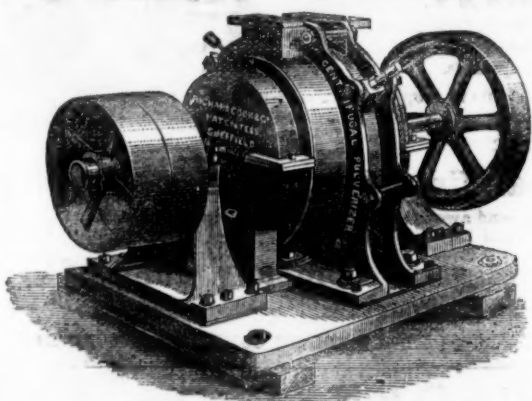
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For depositing **Steel or Nickel** upon **Copper Electrotypes**, to protect the surfaces from the action of Mercurial Inks, and at the same time preserving the clear brilliancy of vermilion, and other colours having mercury in their composition.

For depositing **Tin** upon the backs of **Electrotypes**, completely superseding the old method.

For depositing **Gold, Silver, Nickel, Bronze, Zinc, &c.**, in **Electro-Plating.**

SPECIALITIES.

THE

"Elmore" Dynamo-Electric Machine

For **ELECTRIC LIGHTING** (Arc and Incandescence) for Public Streets and Gardens, large Open Spaces, Theatres, Factories, Workshops, Hotels, Houses, &c.

ENTIRE SYSTEM COMPLETE, EFFICIENT, AND INEXPENSIVE.

Special Apparatus for the application of Ozone and other Gases for Bleaching Oils, Sugars, Fabrics, &c.

Complete Outfits.

The "Elmore" Machines and appliance for **TIN-PLATE MANUFACTURE.**

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The "Elmore" Machines and appliance for **GALVANIZING.**

Complete Outfits.

The "Elmore" Machines and appliance for **REFINING METALS.**

Complete Outfits.

The "Elmore" Machines and appliance for **EXTRACTING METALS FROM ORE,**

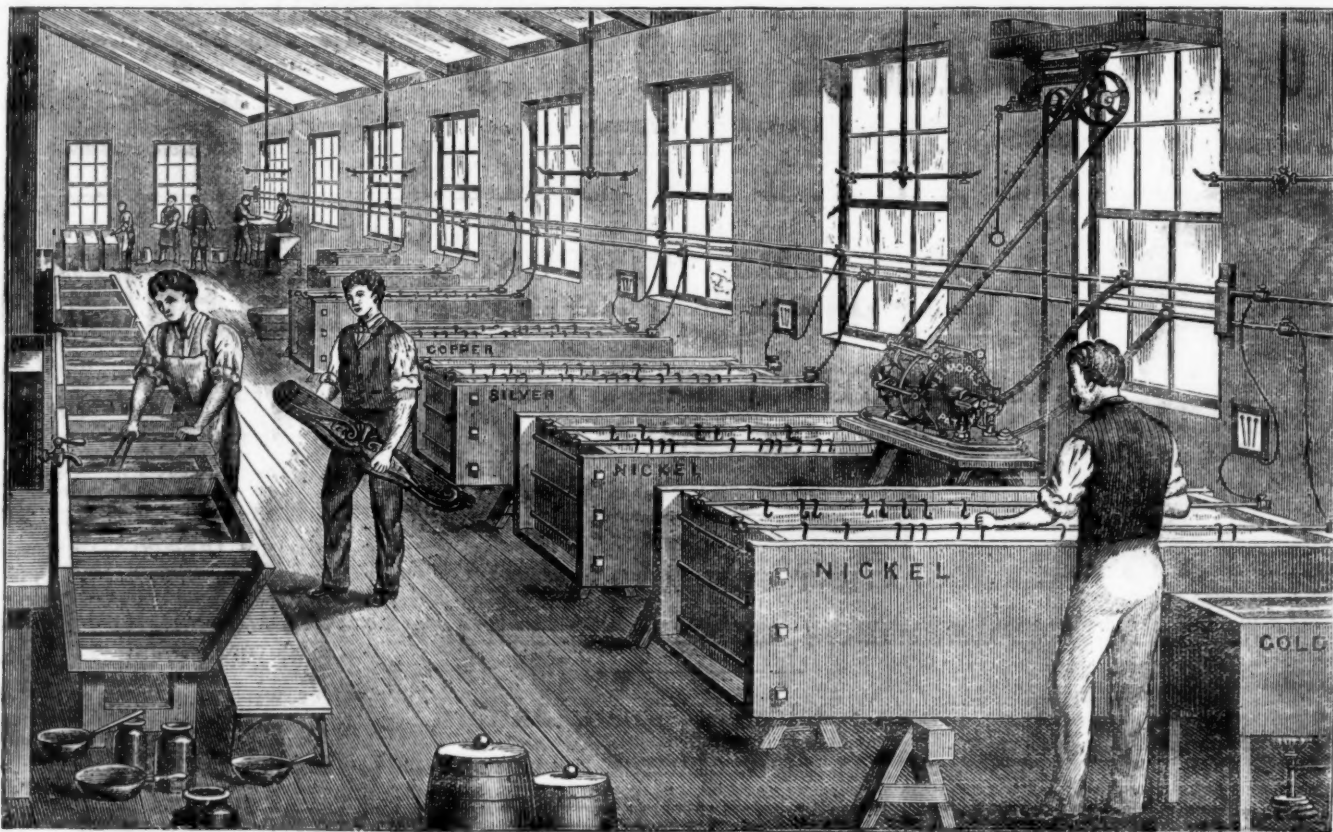
Complete Outfits.

The "Elmore" Machines and appliance for **GENERATING OXYGEN,**

Hydrogen, Chlorine, Ozone, and other Gases.

COMPLETE WORKING INSTRUCTIONS FURNISHED.

COMPLETE WORKING OUTFITS SUPPLIED.



The above represents an Electro-Plating Works in which an "ELMORE" PATENT DYNAMO-ELECTRIC MACHINE is being used for the simultaneous deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

TESTIMONIALS, &c.

From the "HARDWARE TRADE JOURNAL."

A MODERN PLATING ESTABLISHMENT.

"Mr. WILLIAM ELMORE, of 91, Blackfriars Road, London, S.E., is busily engaged fitting up the Art Metal Depositing Works of the Electrolytic Company, Charlotte Street, Blackfriars. The Electro-plating tanks of nickel, copper, brass, zinc, and tin, holding several thousands of gallons each (worked by an 'Elmore' Patent Dynamo-Electric Machine, capable of depositing about 500 lbs. of metal per day), and the specially designed and constructed polishing machinery will all combine to constitute this most gigantic and complete arrangement of the kind in the world. Here boiler tubes, each over 20 ft. in length, may be coated with copper, large ornamental iron lamp posts, and similar massive iron structural objects of great weight may be covered with electro-deposited copper, forming, when finished, a complete shell of bronze, which may be nickel-plated, or even silver-plated, if desired. Large rough or polished iron surfaces may be coated with brass, or zinc, or tin. Copper electrolytic copies are taken of art subjects, the reproduction being so perfect that the process is used for multiplying plates from which bank-notes are printed, and the most delicate ferns, leaves, and insects are coated with copper, and afterwards with gold, silver, nickel, &c., for use as ornaments of various kinds. Fenders, fire-irons, grates, &c., may be brassed. The largest marine engines may be nickel-plated in the large nickel-plating plant, worked by the powerful 'Elmore' machine with ease and certainty, which only a few months since would have been pronounced almost impossible. The Electrolytic Company, we understand, express perfect satisfaction with the work already completed by Mr. Elmore, and there is no doubt that with that gentleman's large practical experience the company could not have been in better hands. The entire premises will be lighted by the 'Elmore' system of electric light."

From the "LONDON MINING JOURNAL."

"The new 'Elmore' Dynamo-Electric Machine can be seen in operation in London, and is considered one of the most wonderful scientific apparatus which has yet been brought before the public; it should be inspected by all who are interested in any kind of metallurgical operations."

"Mr. ELMORE has just received two pieces of ordnance from Her Majesty's Works at Chatham, with an order to nickel-plate the same, together with the carriages upon which they are mounted. Mr. Elmore has done similar work for the Government on previous occasions, and it will be remembered that the screw propellers used on the torpedo boats were nickel-plated by him. The 'Elmore' Dynamo-Electric Machines and complete electro-plating outfits have been supplied to Government Departments at home and abroad."

From the NICKEL PLATING COMPANY, 13, GREEK STREET, SOHO.

Your Machine does its work most satisfactorily, and has never once reversed current, which the Weston Machine frequently did."

From the ELECTROLYTIC COMPANY,

ART METAL DEPOSITING WORKS, CHARLOTTE STREET, BLACKFRIARS, LONDON.

"The 'Elmore' Dynamo-Electric Machine and entire outfit which you have supplied to this company have given perfect satisfaction."

From the NICKEL AND SILVER PLATING WORKS,

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"Having had one of the 'Elmore' Patent Dynamo-Electric Machines in constant use for several months, it gives me great pleasure to say that with it I have been able to deposit four times the weight of metal per day which I had been enabled to do with the Dynamo-Electric Machine, which it has displaced in my establishment."

From the LONDON NICKEL PLATING COMPANY.

"We have much pleasure in expressing our entire satisfaction with the nickel-plating solution, anodes, and Dynamo Machine that you have supplied us with."

From the DYNAMO-ELECTRIC PLATING WORKS,

2, OLD SWAN LANE, LONDON.

"The quality of the nickel solutions and anodes at these works, which were supplied by you, is most satisfactory in every way. The Dynamo Machine also works excellently, and has given no trouble whatever since it has been started."

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Dynamo-Electric Machines, Outfits, &c., supplied to (London) Messrs. Thos. De la Rue and Co., Cassell, Petter, and Galpin, The India Rubber Company (Limited), Silvertown, The Nickel Plating Company, Joseph Woodricka, Kelly and Co., A. S. Cattell and Co., &c., &c., (Birmingham) Messrs. Wright and Butler, Joseph Woodward, The Griffin Gilding and Plating Company, and over 500 others.

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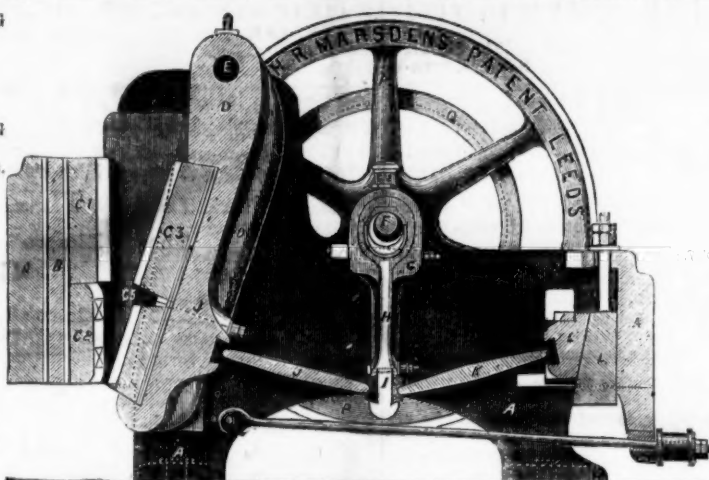
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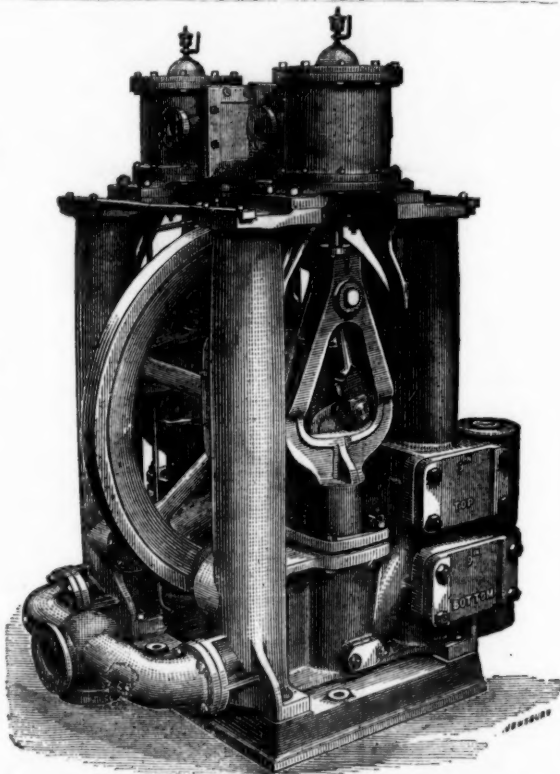
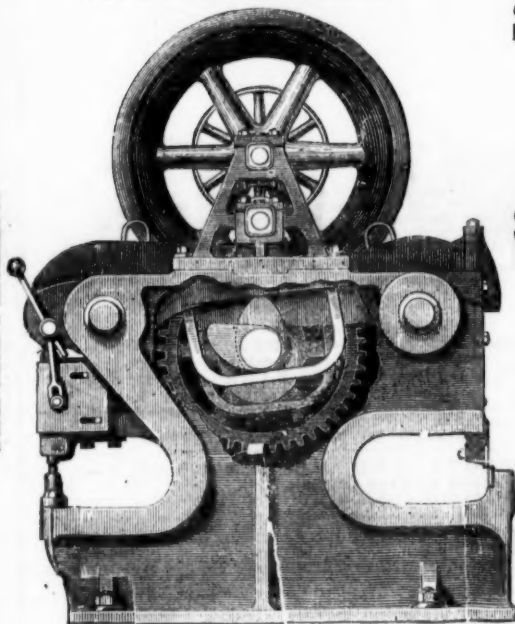
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